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Rec'd 2/27/03 18 Sm

H & Safety Plan

CRS

February 25, 2003

VIA OVERNIGHT DELIVERY

Gwendolyn Massenburg
Remedial Project Manager
U.S. EPA, Region V (SR-6J)
77 West Jackson Blvd.
Chicago, IL 60604-3590

Re: CRS Site Quality Management Plan and Health & Safety Plan Re-Submission and Request for Extension of Time to Resubmit Remaining Plan Revisions

Dear Ms. Massenburg:

On behalf of the CRS Site Group, I am submitting with this letter the revised pages of the CRS Site Health and Safety Plan (HASP) along with a summary of our response to the suggested recommendations in your February 11, 2003 correspondence. Attachment A also contains instructions on where these revised pages should be inserted into the previously submitted Health & Safety Plan. I have also attached Parsons' response to Region V's comments on Parsons' Quality Management Plan and the revised pages for the QMP with instructions for updating the previously submitted QMP (see Attachment B). We believe that these updated plans are now complete. Please confirm that no further revisions are necessary for these documents.

Gary Gifford has formally replaced Jeff Sussman as the Chair of the CRS Site Group Technical Committee. I understand that you met with Gary last week (Feb. 20, 2003) and that significant progress has been made in the development of an acceptable RI/FS Work Plan and Field Sampling Plan. These Plans and the Quality Assurance Project Plan are being revised extensively based on the new approach to field sampling and analysis that Parsons presented at the meeting. We expect the QAPP to be complete on or before March 13, 2003, which is the end of the 30 day period for amending and resubmitting plans in response to your February 11, 2003 Notice of Deficiencies. We will need additional time to complete the changes to the RI/FS Work Plan and the Field Sampling Plan and then give the CRS Site Group Steering Committee the opportunity to review and approve the new plans. Therefore, we request an extension of the 30-day period for amending and resubmitting the RI/FS Work Plan and the FSP to April 14, 2003.

Thank you for considering this request. Please provide written confirmation of U.S. EPA's decision regarding our request for extension.

Sincerely,

Douglas McWilliams

Douglas McWilliams
CRS Site Group Chairperson

Enclosures

Copy: Thomas Nash, Associate Regional Counsel, U.S. EPA
Lawrence Antonelli, Ohio EPA
Gary Gifford, CRS Technical Committee Chairperson

ATTACHMENT A

Response to U.S. EPA Region V Suggested Revisions on the CRS Site Group Final RI/FS Health and Safety Plan for the Chemical Recovery Systems Site in Elyria Ohio

U.S. EPA GENERAL COMMENTS

To the Emergency Contacts page, Chemical Recovery Systems Contacts: Add Gwendolyn Massenburg, U.S. EPA Region V, Remedial Project Manager (RPM), (312) 886-0983, and Lawrence Antonelli, Ohio EPA, Site Coordinator, (330) 963-1127. To the Media Contact section, remove Gwen Massenburg, and add Zenny Sadlon, U.S. EPA Region V, Community Involvement Coordinator (312) 886-6646.

Response:
These Contacts have been added to the Emergency Contacts list in the front of the Health and Safety Plan.

Comment:
It is the U.S. EPA's remedial policy not to approve/disapprove the Site Health and Safety Plan. It is the contractor's responsibility to ensure the health and safety of its personnel and to control off-site releases by safe work practices. It is recommended at a minimum, the site Health And Safety Plan (HASP) should contain the following eleven elements:

Response:
The Health and Safety Plan has been reorganized as requested by U.S. EPA in the order requested with the additional breakdown of Sections increasing the number of Sections of the document.

Comment:

1. **Names of key personnel responsible for site safety - 29 CFR 1910.120(b)(2).**

    a. The identification of the alternate health and safety personnel is strongly recommended.
    b. A Health and Safety Officer also should be identified.

Response:
Section 1.4 has been modified to note that an alternate Site Safety Officer will be assigned if the assigned personnel are not performing work on-Site. The Project Health and safety Officer has been identified.

Comment:

2. **Safety and Health Risk Analysis for each site task or operation - 29 CFR 1910.120(b)(4).**

    a. This is your HASP "Hazard Analysis" section. The only comment to this section is to change the name to meet the 29 CFR 1910.120(b)(4) element designation.

Response:
This change has been made.

Comment:

3. **Site control measures - 29 CFR 1910.120(d).**

a. Information containing the use of the "buddy system" during all site operations is provided in your HASP, however it should be a part of this element.
b. A site map that includes the location of the work zones should be added to this element.
c. Information regarding site communication should be added to this element.

Response:
These items have been added to Section 7 of the HASP.

Comment:

4. **Employee Training - 29 CFR 1910.120(e).**

a. Section 5.1 Accident Prevention, page 24 of 28. States that all field personnel will receive health and safety training prior to the initiation of any site activities. It is not clear if the appropriate employee health and safety training as required by 29 CFR 1910.120(e) which is the comprehensive 40-hour Hazardous Materials Incidence Response Operation training. Please identify specifically the type of training in Section 5.1.
b. Although it may be stated elsewhere in the document, it is under this element where the HASP should indicate that all individuals expected to be on-site have the requisite initial health and safety training.
c. The HASP should indicate here that individuals functioning in a supervisory capacity have the requisite supervisory training.
d. The HASP should indicate that all individuals functioning independently of an immediate supervisor have a minimum of three days of actual field experience under a skilled supervisor.
e. The HASP should indicate in this element that all individuals who had their initial health and safety training longer than one year ago have also completed the required annual health and safety refresher training.
f. Here the HASP should indicate that employees have the training to recognize the symptoms and signs of overexposure to chemical hazards.

Response:
Section 3 Training has been modified to incorporate these items.

Comment:

5. **Medical Surveillance - 29 CFR 1910.120(f).**

a. It is recommended that site personnel who may be exposed at or above the OSHA - PELs or other published exposure levels or who wear respirators 30 or more days each year are enrolled in a comprehensive medical monitoring program.

Response:
Section 5 addresses this item.

Comment:

6. **Personal Protective Equipment - 29 CFR 1910.120(b)(2).**

   a. This should be a separate element, and should be separate from the Medical Surveillance element.

Response:
This has been separated and is now Section 4.

Comment:

7. **The Frequency and Types of Air Monitoring, Personnel Monitoring, and Environmental Sampling Techniques - 29 CFR 1910.120(h).**

   a. A site-specific air-monitoring program to evaluate the exposure potential of all identified and suspected chemical contaminants that could result for all the site activities. To see the types of air monitoring programs typically employed reference 29 CFR 1910.1000-1048, OSHA has published specific personal exposure monitoring requirements for 23 chemical substances. Are any of the chemical substances listed in 29 CFR 1910.1001-1096 known or suspected to be on site.
   b. More specifically the HASP must indicate that upon initial entry, representative air monitoring shall be conducted to identify IDHL conditions, exposure above OSHA-PELS or other published exposure levels including exposure to radiation, flammable atmospheres and/or oxygen deficient atmospheres.
   c. The Frequency and Types of Air Monitoring should be provided.

Response:
An air-monitoring program is already detailed in Section 6, which includes monitoring upon initial entry to the Site. As the contaminants of concern are volatile organics, we are monitoring using a PID or an FID supplemented with colorimetric tubes for vinyl chloride and methylene chloride. There is no need to monitor for radiation. A combustible gas meter and an oxygen meter will be used when operations warrant their use as detailed in the HASP. We have added to the Plan that Personal air monitoring is not required for this Project.

Comment:

8. **The Confined Space Entry Procedures - 29 CFR 1910.120(j)(9).**

   a. If a confined space entry is anticipated on-site, the HASP should contain a section on the procedures for confined space entry that meets the 29 CFR 1910.146. A Not Applicable response indicates that the confined space entry on-site is not anticipated.

Response:
It is noted in Section 1.3 that confined space entry is not anticipated, but a brief section addressing confined space entry requirements has been left in the HASP.

Comment:

9. **A Spill Containment Program - 29 CFR 1910.120(j).**

a. It is not anticipated that this element is applicable to the site.

Response:

Although not anticipated to be an issue, a Section 11 addressing this item has been added, as spills from equipment, etc may arise.

Comment:

10. **A Decontamination Program - 29 CFR 1910.120(k).**

a. The Decontamination Element of Section 4.2 should be a stand-alone element of the HASP. If Level C protection is used monitoring of the decontamination procedures by the site health and safety supervisor is recommended.

Response:

This has been separated out as Section 8.

Comment:

11. **Emergency Response Plan - 29 CFR 1910.120(l).**

a. This should be a stand-alone element.

b. It is strongly recommended that a separate section for the emergency response plan be available for inspection and copying by the employees, their representatives, OSHA personnel, and other governmental agencies with relevant responsibilities.

c. The emergency response plan in the HASP should provide for the on-site emergencies by addressing the following:

1. Pre-emergency Planning;
2. Personnel Roles, lines of authority and communication;
3. Emergency and recognition and prevention;
4. Site security and control;
5. Evacuation routes and procedures;
6. Decontamination procedures not covered in other parts oft he HASP;
7. Emergency medical treatment and first aid.
8. Emergency alerting and response procedures;
9. Procedures for critique of response and follow-up;
10. PPE and emergency equipment needed;
11. Site topography, layout; and
12. A method for determining wind directions that are visible to employees in the event of a site evacuation.

d. It is strongly recommended that the site health and safety officer should always be on-site during field operations.

e. A copy of the HASP manual should be on-site during all operations, and it should be easily accessible for all personnel.

Response:
This is now Section 9. A designated Site Safety Officer is always on Site. The Project Health and Safety Officer is not always on Site. A copy of the HASP is required to always be on-Site during field operations.

Comment:
Please submit the document with the appropriate 29 CFR 1910.120 subject elements heading. If any of the elements are not applicable to the site, the element should be listed as not applicable to the site.

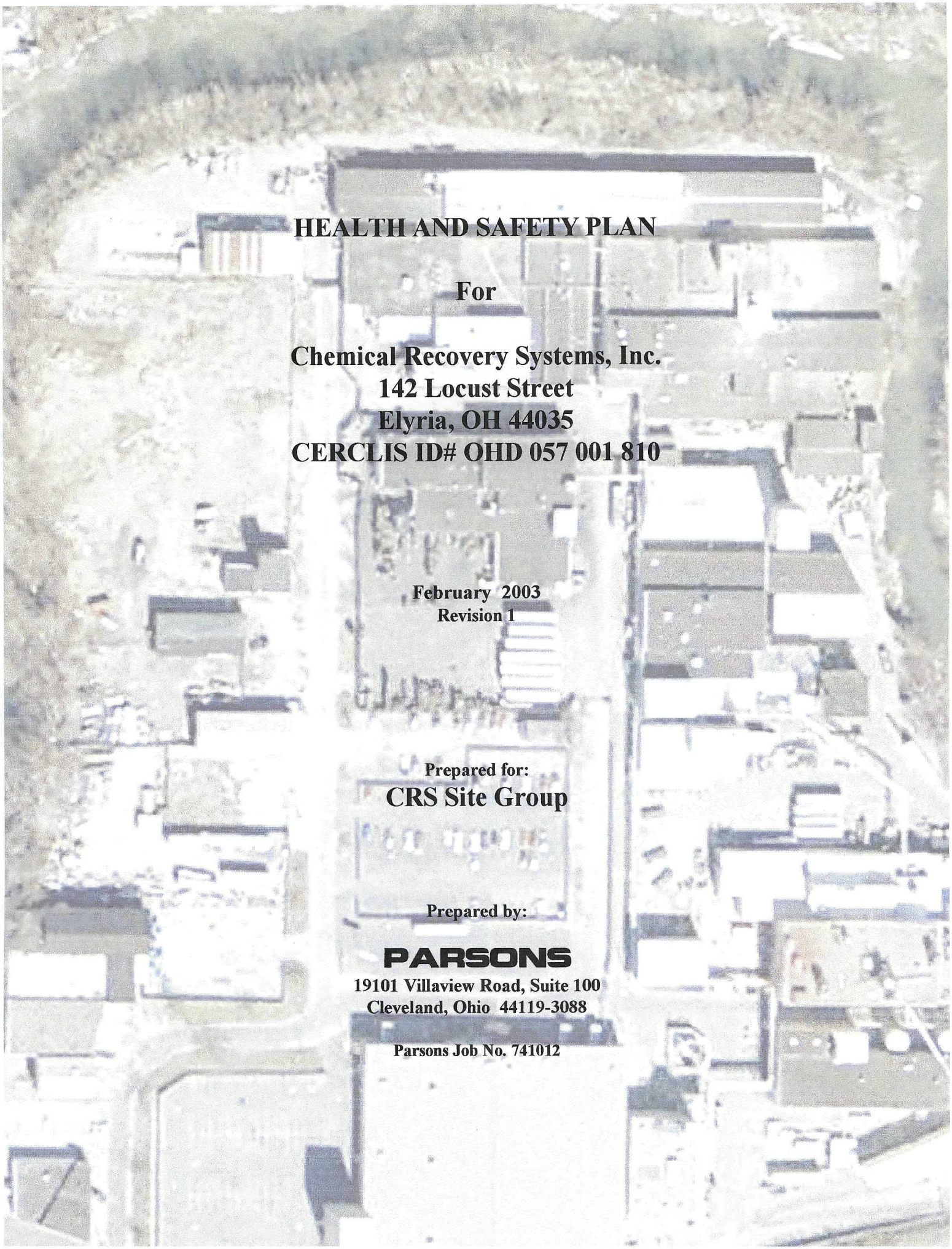
Response:
The document has been revised as requested

HEALTH AND SAFETY PLAN
For
The Chemical Recovery Systems Site
142 Locust Street
Elyria, OH 44035
CERCLIS ID# OHD 057 001 810

February 2003
Revision 1

Summary of Inserts
(All pages through Section 5 and Appendix C are replacement pages)

Item	Location
Color Cover	Inside Front Outside Plastic Pocket
Title Page	First page inside report
Emergency Contacts Page (page i)	After first page
Map	After Emergency Contacts page
Table of Contents (pages iii – vi)	after Map
Sections 1 through 5	Replace Sections in entirety
Section 6 through 11	Add new Sections
Appendix C	Replace Appendix in entirety



HEALTH AND SAFETY PLAN

For

Chemical Recovery Systems, Inc.
142 Locust Street
Elyria, OH 44035
CERCLIS ID# OHD 057 001 810

February 2003
Revision 1

Prepared for:
CRS Site Group

Prepared by:

PARSONS
19101 Villaview Road, Suite 100
Cleveland, Ohio 44119-3088

Parsons Job No. 741012

HEALTH AND SAFETY PLAN

Chemical Recovery Systems, Inc.
142 Locust Street
Elyria, OH 44035
CERCLIS ID# OHD 057 001 810

REVISION 1
FEBRUARY 2003

Prepared for:

CRS Site Group

Prepared by:

PARSONS
19101 Villaview Road - Suite 100
Cleveland, Ohio 44119-3088

Parsons Job No. 741012

REVIEWED AND APPROVED BY:

	Name	Date
Project Manager	Peter Gelman	
Parsons Office Health and Safety Representative	Roger Ihle	

EMERGENCY CONTACTS

In the event of any situation of unplanned occurrence requiring assistance, the appropriate contact(s) should be made from the list below. For emergency situations, contact should first be made with the Field Team Leader (or designee) who will notify emergency personnel. The emergency personnel will then contact the appropriate response team(s). This emergency contacts list must be in an easily accessible location at the site.

Contingency Contacts	Phone Number
Nearest phone located on-site:	None
Police / Fire Department:	911
County Sheriff:	440-329-3709
Poison Control Center:	216-231-4455
Parsons Contract Physician:	Frank L. Mitchell, DO Qualisys 4501 Circle 75 Parkway, Suite B-2190 Atlanta, GA 30339 770-226-9944

Medical Emergency	
Hospital Name:	EMH Regional Medical Center
Hospital Phone No.:	440-329-7500
Hospital Address:	630 East River Street
Travel Time from Site:	3 minutes
Map to Hospital (see next page):	
Ambulance Service:	440-323-2527
Route to Hospital:	Go south on Locust Street. Continue on Pine Street. Turn left onto East Ave. Turn left onto Broad Street and go east for 900 feet. Turn left onto East Bridge Street. Turn right onto East River Street. Go south for 0.2 miles to hospital.

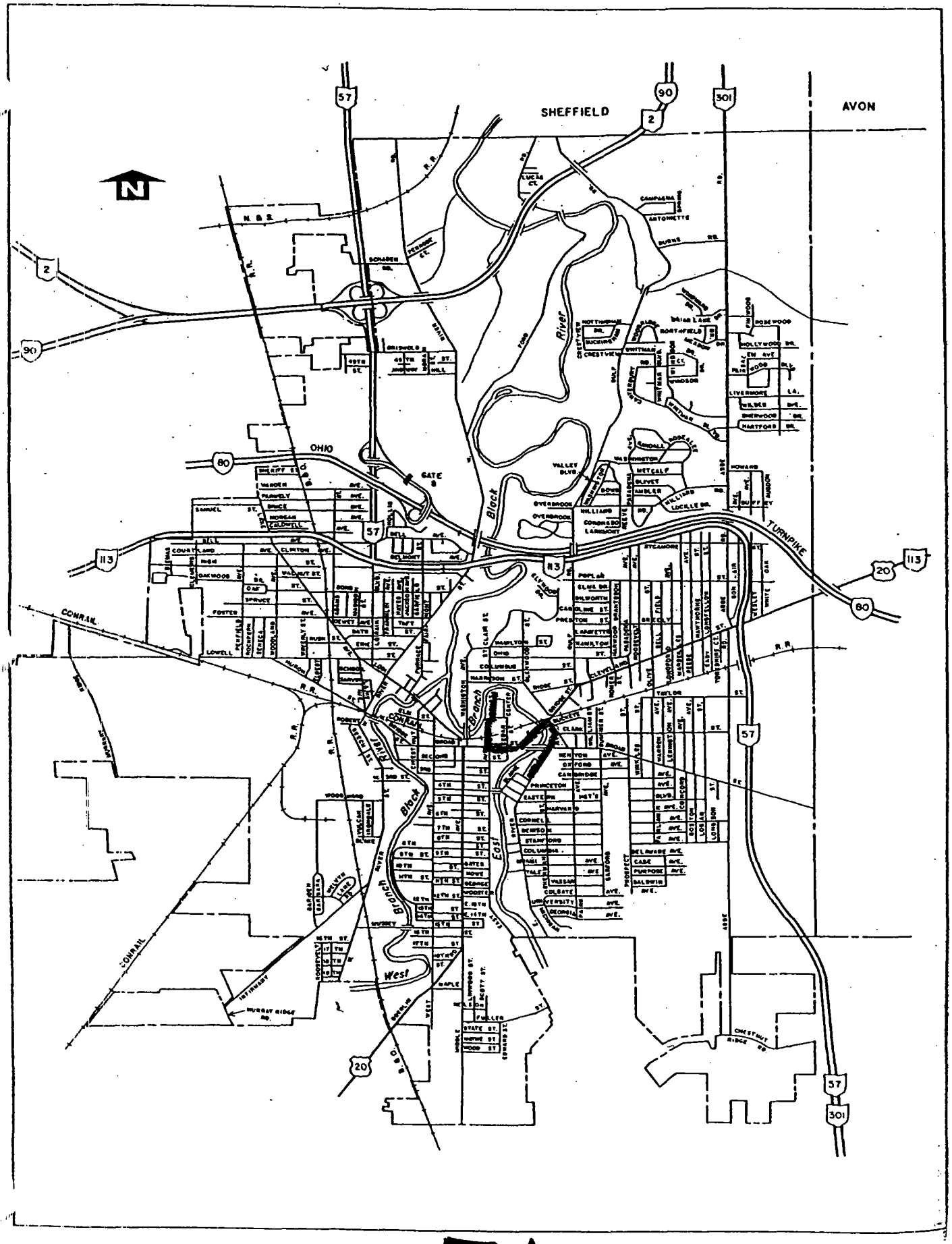
Chemical Recovery Systems Contacts	
Doug McWilliams	(216) 407-4968
Jeff Sussman	(330) 322-0563
Gwen Massenburg (U.S. EPA Region V – Remedial Project Manager)	(213) 886-0983
Lawrence Antonelli (Ohio EPA, Site Coordinator)	(330)-963-1127

Parsons Contacts	
Peter Gelman / Rick Volpi Parsons Project Manager / RI Task Manager	(216) 486-9005
Peter Gelman (cell phone):	(216) 701-3635
Rick Volpi (cell phone):	(216) 577-6437
Roger Ihle Parsons Office Health & Safety Representative	(216) 486-9005

Media Contacts:	
Zenny Sadlon (U.S. EPA Region V, Community Involvement Coordinator)	(312)-886-6646

ELYRIA

LORAIN COUNTY



CitMaps

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SECTION 1
INTRODUCTION

SECTION 1
INTRODUCTION

1.1 PURPOSE AND POLICY

This Health and Safety Plan (HASP) for the Chemical Recovery Systems, Inc. (CRS) Site in Elyria, Ohio sets forth the applicable standard operating procedures (SOPs) to ensure the safety of personnel associated with site field activities and to assure the protection of the general public and the environment while field activities are underway at the site. This Plan establishes personnel protection standards and mandatory safety practices and procedures, assigns responsibilities, and provides for contingencies that may arise while operations are being conducted at hazardous waste investigation sites[1].

All Parsons personnel must adhere to the requirements set forth in this Plan. Any supplemental plans used by subcontractors shall conform to the requirements of this Plan, as a minimum. All personnel who engage in project activities must be familiar with this Plan and comply with its requirements. The Project Manager and the Project Health and Safety Officer will enforce compliance accordingly.

Operations at the site are expected to involve soil boring and sampling activities, groundwater well installation, and groundwater sampling activities. The plan shall be modified as required for specific operations and hazards, which are not covered by this Health and Safety Plan.

1.2 SITE DESCRIPTION AND HISTORY

Chemical Recovery Systems, Inc. Site located at 142 Locust Street inElyria, OH 44035

The Site is a former Chemical Recycling Plant Site that consists of approximately 2.5 acres, which is highly vegetated and has a steep drop to the Black River along the western edge of the site. Previous operations consist of recycling paints and solvents from several different manufacturers. Previous investigations resulted in detectable concentrations of volatile organic chemicals (VOCs), semi-volatile organic chemicals (SVOCs), polychlorinated biphenols(PCBs), and Metals. Potential hazards include the possible contact of chemicals of concern, and the steep grade to the Black River.

1.3 SCOPE OF WORK

Operations at the site covered by this health and safety plan include soil boring and sampling activities, groundwater well installation, groundwater sampling, surface water sampling, stream sediment sampling, and possible debris and vegetation cutting and removal. No confined space entry activities are anticipated. All Work is anticipated to be performed in Level D PPE.

---

[1] Nothing herein shall be deemed an admission of fact or law by any CRS Site Group Member.

1.4 PROJECT TEAM ORGANIZATION

Table 1.1 describes the responsibilities of personnel associated with this project. The names and home offices of principal personnel associated with this project are listed below:

Project Manager Peter Gelman

RI Task Manager Rick Volpi

Field Team Leader/
Site Safety Officer: Tammy S. Scurry

Field Team Members: Tammy S. Scurry (others to be determined)

Project Health and Safety Officer: Roger Ihle

All Parsons personnel will have completed 40 hours of training in Hazardous Waste Operations in accordance with 29 CFR 1910.120 (e), and will have completed the required eight-hour refresher training, on an annual basis. In addition, each field team will have Parsons personnel trained in first aid. The Parsons Field Team Leader will be experienced with the types of field operations to be employed at the referenced site. The Project H&S Officer will assign an alternate Site Safety Officer if Tammy Scurry is not performing work at the Site during field operations.

The Project Manager may authorize the RI Task Manager to perform the functions identified in this Health and Safety Plan for the Project Manager. If this is done, the RI Task Manager will keep the Project Manager informed of the activities ongoing at the Site.

1.5 CLIENT SPECIFIC REQUIREMENTS

The Health and Safety Plan must meet the requirements specified in the Administrative Order on Consent and the Statement of Work for the CRS Site including, but not limited to, SOW Task I (iii), which requires that the plan include all 11 elements enumerated in the RI/FS Guidance (USEPA 1988) and that it must follow the Standard Operating Safety Guides (USEPA June 1992).

The Health and Safety Plan must meet the requirements specified in Occupational Safety and Health Administration (OSHA) regulations and protocols outlined in Title 29 of the Code of Federal Regulations (C.F.R.), Part 1910. The Health and Safety Plan must, at a minimum, follow USEPA's guidance document Standard Operating Safety Guides, Publication 9285.1-03, PB92-963414, June 1992.

TABLE 1.1 - ON-SITE PERSONNEL

Title	General Description	Responsibilities
Project Manager	Reports to upper-level management. Has authority to direct response operations. Assumes total control over site activities.	• Prepares and organizes the background review of the situation, the Work Plan, the Site Safety Plan and the Field Team. • Obtains permission for site access and coordinates activities with appropriate officials. • Briefs the Field Teams on their specific assignments. • Uses the Site Safety and Health Officer to ensure that safety and health requirements are met. • Prepares the final report and support files on the design activities. • Serves as the liaison with public officials.
Project Health and Safety Officer	Responsible for determining action levels for on-site work. Advises the Project Manager on all aspects of health and safety. Stops work if any operation threatens worker or public health or safety.	• Coordinates safety and health program activities with the Site Safety Officer. • Oversees the development of the Project Health and Safety Plan. • Coordinates with the Site Safety Officer in determining protection level.
Site Safety Officer/Field Team Leader	Responsible for Field Team operations and safety. Advises the Project Manager on all aspects of health and safety on site. Stops work if any operation threatens worker or public health or safety.	• Periodically inspects protective clothing and equipment. • Ensures that protective clothing and equipment are properly stored and maintained. • Controls entry and exit at the Access Control Points. • Coordinates safety and health program activities with the Project Health and Safety Officer. • Confirms each team member's suitability for work based on a physician's recommendation. • Monitors the work parties for signs of stress, such as cold exposure, heat stress and fatigue. • Implements the Project Health and Safety Plan. • Knows emergency procedures, evacuation routes, and the telephone numbers of the ambulance, local hospital, poison control center, fire department, and police department. • Notifies, when necessary, local public emergency officials. • Coordinates emergency medical care. • Controls the decontamination of all equipment, personnel, and samples. • Assures proper disposal of contaminated clothing and materials. • Ensures that all required equipment is available. • Advises medical personnel of potential exposures. • Notifies emergency response personnel by telephone or radio in the event of an emergency. • Manages field operations. • Enforces safety procedures. • Coordinates with the Project Health and Safety Officer in determining protection level. • Enforces site control. • Documents field activities and sample collection. • Serves as a liaison with public officials.
Work Team	Drillers, Samplers.	• Safely completes the on-site tasks required to fulfill the Scope of Work. • Complies with Site Safety Plan. • Notifies Site Safety Officer or supervisor of suspected unsafe conditions.

SECTION 2
SAFETY AND HEALTH RISK OR HAZARD ANALYSIS

SECTION 2

SAFETY AND HEALTH RISK OR HAZARD ANALYSIS

2.0 SAFETY AND HEALTH RISK ANALYSIS OF WORK TASKS

The anticipated project site activities are identified below. The hazards of each task are analyzed in detail, beginning in Section 2.1. The following subsections describe the potential hazards, the control or protective measures to be employed, and the type of protective equipment to be used by personnel conducting the tasks.

2.1 CHEMICAL HAZARDS

The primary routes of exposure of chemical hazards present at the site are (1) inhalation of vapors and dusts, (2) skin contact with contaminated materials, and (3) ingestion of airborne contaminants. Personnel exposure to chemical hazards will be reduced through the use of appropriate monitoring equipment, proper selection of personal protective equipment (PPE), and good personal hygiene. PPE selection and chemical action levels are discussed in Section 3.0.

A number of products containing hazardous chemicals may be encountered at hazardous waste investigation sites. The chemicals of primary concern are site specific and include: based on previous investigations conducted at the site, chlorinated VOCs and SVOCs, such as vinyl chloride, methylene chloride, TCE, and PCE (see Table 2.1, located at end of Section 2), have been detected in the sites subsurface. Other chemicals of concern are metals (aluminum, manganese, nickel, zinc, and lead) and PCBs (Table 2.1).

Toxicological properties of these compounds are shown in Table 2.1.

Material Safety Data Sheets (MSDSs) for the chemicals of concern for the site are contained in Appendix A. MSDSs for chemical anticipated to be used during the investigation are located in Appendix B.

2.2 PHYSICAL HAZARDS

Hazardous or potentially hazardous activities at the site include drilling and other exploratory procedures, which may be employed while conducting subsurface investigations at the site. These hazardous activities may involve the following:

- Noise;
- Traffic;
- Underground and Overhead Utilities;
- Trenching;
- Trip and Fall;
- Fire and Explosion;
- Exposure to the Elements (Heat/Cold Stress); and
- Environmental Biological Hazards.

2.2.1 Noise

Site activities in proximity to drill rigs, and other heavy equipment often expose workers to excessive noise. The effects of excessive noise include the following:

- PSYCHOLOGICAL EFFECTS: workers being distracted or upset, increased tension;
- PHYSIOLOGICAL EFFECTS: pain, temporary and/or permanent hearing loss, reduced muscular control (extreme exposure); and
- COMMUNICATION INTERFERENCE: increase in potential hazard due to the inability to communicate properly.

The 8-hour time-weighted average (TWA) for noise is 85 dBA, and it is envisioned that situations may arise when site personnel are exposed to noise levels, which exceed the TWA. There are three conditions, which can be used to determine if the noise exposure limit is being exceeded. The conditions are as follows:

1. Personnel must speak in very loud voices or shout directly into the ear of other individuals in order to be understood;
2. Personnel say that they have heard noises and develop ringing in their ears at the end of the day; and
3. Personnel complain that the sound of speech or music seems muffled after leaving work.

Parsons personnel are provided with hearing protection, and are advised to wear hearing protection during periods when the noise level is excessive (e.g., during drilling or heavy equipment operation).

2.2.2 Traffic

Accidental injury, resulting from encounters with motor vehicles, are an inherent hazard of most hazardous waste investigation sites. Accidents may occur while traveling to or from the site, and during activities at the site. Injuries can result from vehicles hitting or running over personnel, or from flying objects generated by vehicle collisions with inanimate objects.

Vehicle Operation

The following precautions should be taken by Parsons personnel, while operating a vehicle during site activities:

- All vehicles used at a site by Parsons personnel will be maintained. Brakes, lights, fluid levels, tires, horns, rear view mirrors and other safety devices will be checked by the operator at least once per day. If the vehicle is deemed unsafe, the operator will ensure that necessary repairs are made.
- Vehicles will not be operated in an unsafe manner.
- Seat belts will be worn when operating a motor vehicle.
- If vehicles are left running, while the vehicle operator is elsewhere, the vehicle parking brake will be engaged.

- Parked vehicles will have transmission engaged unless parking brake is engaged.
- Vehicles will be backed up, only after the operator ensures that there is nothing behind the vehicle.
- Vehicles will not be moved while the doors are open, or while equipment is stowed in an unsafe manner (e.g., on the hood of the vehicle, or where equipment limits the operator's view).

Avoiding Traffic

While Parsons personnel have little control over vehicles operated by the general public, there are several precautions which, if taken, should reduce the chance of vehicle-enduced injuries. These precautions are as follows:

- Barricades and/or temporary fencing shall be used to protect employees when working at any site where motor vehicles operated by the general public pose a safety threat. The barricades used shall conform to the requirements set forth in 29 CFR 1926.202 (ANSI D6.1-1971).
- Barricades and/or temporary fencing shall be placed so as to prevent unauthorized personnel/general public from walking into an area of imminent danger, falling into an open excavation, or endangering site workers.
- Any excavation measuring greater than 12 inches in length, width or depth shall be marked with at least one barricade.
- Signs and symbols required shall be visible at all times while work is being performed and shall be removed or covered promptly when the hazard no longer exists.
- If areas requiring barricades or temporary fencing are to be left unattended overnight, these devices must be equipped with warning lights.
- When site activities are such that barricades provide insufficient protection (e.g., when on or adjacent to a highway or street, or on the premises of a very busy facility), flagmen or other appropriate traffic controls shall be utilized (refer to 29 CFR 1926.201).
- Flagmen and other personnel shall be provided with, and shall wear red or orange warning vests while performing activities in high traffic areas. Warning garments worn after dark shall contain reflectorized material.
- Flags utilized by flagmen shall be red or orange, and shall be at least 18 inches square. In periods of darkness, flagmen shall use red lights.
- Any local legal ordinances and codes regarding traffic control shall be obeyed (e.g., some municipalities require local police to be present when drilling in the streets).

2.2.3 Underground and Overhead Utilities

Overhead power lines, downed electrical wires, temporary electrical circuits and buried cables can pose a danger of shock or electrocution, if workers contact or sever them during site activities. Electrical equipment used at the site may also pose a shock hazard to field personnel. In addition, other utilities, including gas, sewers, TV cables, septic systems, and water, located in the subsurface at hazardous waste investigation sites, may pose other dangers if these utility conduits are breached. To minimize these hazards, the following steps must be followed:

- The client shall be notified of the date of the site field work.
- A site blueprint shall be requested from the client, and if the client complies with this request, the blueprint shall be available at the site during all subsurface investigations.
- The utility location service shall be contacted prior to any subsurface investigation at the site. The Ohio Utilities Protection Service (OUPS) must be contacted at least 48 hours prior to digging (1-800-362-2764). If this service is unavailable in the area, the individual utilities shall be contacted, and asked to mark the locations of subsurface utilities at the site.
- All underground utility locations shall be confirmed by the facility owner/operator prior to excavation/drilling activities at the site.
- Operation of drill rigs and other equipment possessing a boom shall adhere to the power line clearance distances set forth in 29 CFR 1910.333 and 29 CFR 1926.550.
- Where necessary, utilities shall be deactivated prior to site activity.
- Where fitting, electrical equipment used by Parsons personnel shall be grounded or double insulated, and where flammable vapors/dust are a concern, this equipment shall be approved as intrinsically safe.
- Extension cords used with portable electrical equipment shall be three-wire type and shall be designed for hard and extra hard usage.
- All receptacle outlets that are not a part of the permanent wiring of the building or structure at the site shall have approved ground-fault circuit interrupters.

2.2.4 Trenching and Excavation

In trenches less than four feet deep, precautions taken to insure the safety of employees and the general public include the use of barricades, caution tape and flags. Trenches and other excavations shall be sloped according to the regulations presented in 29 CFR 1926 Subpart P. Parsons personnel shall not enter an excavation that is greater than 4 feet in depth unless the walls of the excavation are guarded by a shoring system, sloping of the ground, or some equivalent means of protecting personnel in the event of collapse. A safe means of exit from an excavation must be provided when the excavation depth is 4 feet or greater, and the exits must be spaced at lateral intervals of 25 feet or less. In some circumstances, trenches may be classified as a Permit Required Confined Space and require Entry Procedures that involve the

use of certified, trained individuals, and OSHA-approved equipment. Permit-Required Confined Space Entry will not be attempted unless certified, trained individuals and required equipment are employed. If the only hazard associated with the confined space is atmospheric, and the hazardous atmosphere can be eliminated with engineering controls, the space can be re-classified as a Non-Permit Required Confined Space. Before entering an excavation, the atmosphere must be tested to determine if it is hazardous.

2.2.5 Trip and Fall

Trip and fall hazards exist at all hazardous waste investigation sites. Although many of these hazards are not under the control of Parsons personnel, hazards can be minimized by observing the following housekeeping practices:

- Tools, materials, extension cords, hoses or debris will be located so as to minimize tripping hazards.
- All excavations, trenches, unfinished monitoring wells, etc. will be secured and posted as necessary.

2.2.6 Fire and Explosion

Compounds associated with hazardous waste investigation sites may be flammable and/or explosive. Gasoline vapors can be highly explosive, having a flash point of about 40° F. Diesel oil is combustible, with a flash point of 110° to 190° F and is considered to be a moderate fire hazard. Potential ignition sources for this material include use of non-spark-free (non-intrinsically safe) tools and flashlights, open flame, cigarettes, and electrical equipment.

The following practices shall be followed, in order to minimize the chance of fire and explosion, while performing activities at hazardous waste investigation sites:

- Fire extinguishers shall be provided, and must be available during site activities. The extinguishers must be rated for Class A (wood, paper), Class B (flammable liquids) and Class C (electrical) fires.
- Appropriate monitoring equipment shall be available at the site, and shall be used during all intrusive activities.

When monitoring equipment indicates that fire/explosion hazards exist, or when it is reasonable to assume that these hazards may develop, the following fire prevention steps shall be observed:

Ignition hazards shall be located, and deactivated (e.g., only intrinsically safe equipment/tools shall be used);

- Internal combustion engines shall be located well away from combustible materials;
- Smoking shall be prohibited;
- Flammable liquids shall be stored and disposed of properly; and
- Use of heaters, cutting torches, etc., shall be prohibited.

2.2.7 Heat Stress

The use of protective equipment, if required, may create heat stress. Monitoring of personnel wearing personal protective clothing should commence when the ambient temperature is 70 °F or above. Table 2.2 presents the suggested frequency for such monitoring. Monitoring frequency should increase as the ambient temperature increases or as slow recovery rates are observed. Heat stress monitoring should be performed by a person with a current first aid certification who is trained to recognize heat stress symptoms. For monitoring the body's recuperative abilities to excess heat, one or more of the following techniques will be used. Other methods for determining heat stress monitoring, such as the wet bulb globe temperature (WBGT) Index from American Conference of Governmental Industrial Hygienist (ACGIH) TLV Booklet can be used.

TABLE 2.2

SUGGESTED FREQUENCY OF PHYSIOLOGICAL MONITORING FOR FIT AND ACCLIMATIZED WORKERS [a]

Adjusted Temperature [b]	Normal Work Ensemble [c]	Impermeable Ensemble
90°F (32.2°C) or above	After each 45 minutes of work	After each 15 minutes of work
87.5°-90°F (30.8°-32.2°C)	After each 60 minutes of work	After each 30 minutes of work
82.5°-87.5°F (28.1°-30.8°C)		After each 60 minutes of work
77.5°-82.5°F (25.3°-28.1°C)		After each 90 minutes of work
72.5°-77.5°F (22.5°-25.3°C)		After each 120 minutes of work

[a] For work levels of 250 kilocalories/hour.

[b] Calculate the adjusted air temperature (ta adj) by using this equation: ta adj °F = ta °F – (0.13 x % sunshine). Measure air temperature (ta) with a standard mercury-in-glass thermometer, with the bulb shielded from radiant heat. Estimate percent sunshine by judging what percent time the sun is not covered by clouds that are thick enough to produce a shadow. (100 percent sunshine = no cloud cover and a sharp, distinct shadow; 0 percent sunshine = no shadows.)

[c] A normal work ensemble consists of cotton coveralls or other cotton clothing with long sleeves and pants.

To monitor the worker, measure:

- **Heart Rate**. Count the radial pulse during a 30-second period as early as possible in the rest period.
  - If the heart rate exceeds 100 beats per minute at the beginning of the rest period, shorten the next work cycle by one-third and keep the rest period the same.
  - If the heart rate still exceeds 100 beats per minute at the next rest period, shorten the following work cycle by one-third.
- **Oral Temperature**. Use a clinical thermometer (3 minutes under the tongue) or similar device to measure the oral temperature at the end of the work period (before drinking).
  - If oral temperature exceeds 99.6 °F (37.6 °C), shorten the next work cycle by one-third without changing the rest period.
  - If oral temperature still exceeds 99.6 °F (37.6 °C) at the beginning of the next rest period, shorten the following cycle by one-third.
  - Do not permit a worker to wear a semi-permeable or impermeable garment when oral temperature exceeds 100.6 °F (38.1 °C).

Prevention of Heat Stress

Proper training and preventive measures will aid in averting loss of worker productivity and serious illness. Heat stress prevention is particularly important because once a person suffers from heat stroke or heat exhaustion, that person may be predisposed to additional heat related illness. To avoid heat stress, the following steps should be taken:

- Adjust work schedules.
- Modify work/rest schedules according to monitoring requirements.
- Mandate work slowdowns as needed.
- Perform work during cooler hours of the day if possible or at night if adequate lighting can be provided.
- Provide shelter (air-conditioned, if possible) or shaded areas to protect personnel during rest periods.
- Maintain worker's body fluids at normal levels. This is necessary to ensure that the cardiovascular system functions adequately. Daily fluid intake must approximately equal the amount of water lost in sweat, i.e., eight fluid ounces (0.23 liters) of water must be ingested for approximately every eight ounces (0.23 kg) of weight lost. The normal thirst mechanism is not sensitive enough to ensure that enough water will be drunk to replace lost sweat. When heavy sweating occurs, encourage the worker to drink more. The following strategies may be useful:
  - Maintain water temperature at 50 ° to 60 ° F (10 ° to 16.6 ° C).

- Provide small disposable cups that hold about four ounces (0.1 liter).
- Have workers drink a cup or two every 15 to 20 minutes, or at each monitoring break. A total of 1 to 1.6 gallons (4 to 6 liters) of fluid per day are recommended, but more may be necessary to maintain body weight.

- Train workers to recognize the symptoms of heat related illnesses.

2.2.8 Cold Related Illness

If work on this project begins in the winter months, thermal injury due to cold exposure can become a problem for field personnel. Systemic cold exposure is referred to as hypothermia. Local cold exposure is generally labeled frostbite.

Hypothermia - Hypothermia is defined as a decrease in the patient temperature below 96 degrees F. The body temperature is normally maintained by a combination of central (brain and spinal cord) and peripheral (skin and muscle) activity. Interference with any of these mechanisms can result in hypothermia, even in the absence of what normally is considered a "cold" ambient temperature. Symptoms of hypothermia include: shivering, apathy, listlessness, sleepiness, and unconsciousness.

Frostbite - Frostbite is both a general and medical term given to areas of local cold injury. Unlike systemic hypothermia, frostbite rarely occurs unless the ambient temperatures are less than freezing and usually less than 20 °F. Symptoms of frostbite are: a sudden blanching or whitening of the skin; the skin has a waxy or white appearance and is firm to the touch; tissues are cold, pale and solid.

Prevention of Cold Related Illnesses

- Educate worker to recognize the symptoms of frostbite and hypothermia.
- Identify and limit known risk factors:
  - Prohibit phenothiazine (a sedative) use.
  - Identify/warn/limit beta blocker use.
- Assure the availability of enclosed, heated environment on or adjacent to the site.
- Assure the availability of dry changes of clothes.
- Develop capability for temperature recording at the site.
- Assure the availability of warm drinks.

Monitoring

Start (oral) temperature recording at job site:

- At the Field Team Leader's discretion when suspicion is based on changes in worker's performance or mental status.

- At worker's request.
- As a screening measure, two times per shift, under unusually hazardous conditions (e.g., wind-chill less than 20 °, or wind-chill less than 30 °F with precipitation).
- As a screening measure whenever any one worker on the site develops hypothermia.

Any person developing moderate hypothermia (a core temperature of 92 °F) cannot return to work for 48 hours.

2.2.9 Environmental Biological Hazards

Environmental biological hazards which may be present at a site include tickborne diseases, stinging and biting insects, vermin and wild animals, snakes, and poisonous plants. Tickborne diseases include lyme disease and rocky mountain spotted fever. Stinging and biting insects include spiders, mosquitoes, chiggers, bees, and wasps. Poisonous plants include poison ivy, poison oak, and poison sumac.

Protection against hazards from animals and insects shall include, as applicable, the following measures:

- PPE such as long sleeve shirts, gloves, boots, netting, and masks;
- Repellents;
- Barrier creams;
- Instruction in recognition and identification of the harmful plants, animals, and insects; and
- Removal of harmful plants, animals, and insects through engineering measures such as burning, defoliation, and elimination of breeding grounds.

Clothing should be inspected frequently when in a tick habitat. The head and body should be inspected thoroughly upon leaving the field. Not all ticks are infected with the bacterium which causes Lyme disease and rocky mountain spotted fever. Removal of ticks is best accomplished using small tweezers. The ticks body should not be squeezed. The tick should be saved in a jar labeled with the date, body location of the bite, and the place where it may have been acquired. The bite area should be cleaned with antiseptic and medical attention should be sought as soon as possible. Lyme disease typically occurs in the summer months and is characterized by a slowly expanding red rash, which develops a few days to a few weeks after the bite of an infected tick. This may be accompanied by flu-like symptoms along with headache, stiff neck, fever, muscle aches, and/or a general malaise. Medical treatment at this stage is critical, as these early symptoms may disappear and more serious problems may follow. Rocky mountain spotted fever is transmitted by the Dog Tick which is larger than the Deer Tick which transmits Lyme disease. Rocky mountain spotted fever usually occurs in the spring or summer. Infection generally manifests itself several days after exposure. The onset of the

illness is abrupt and often accompanied by high fever, headache, chills, and severe weakness. Early detection and treatment significantly reduces the severity of illness.

For minor bites and stings from insects first clean the area and then apply a cold pack to the affected area and/or apply soothing lotions such as calamine. If the victim has a history of allergic reactions to insect bites or is subject to attacks of hay fever or asthma, seek immediate medical assistance.

Contact with vermin and wild animals should be avoided. Be alert to the possible presence of vermin and wild animals particularly when working in brushy and wooded areas. Be observant to the possible presence of snakes in wooded and brushy areas. Most snakes will escape rather than attack when confronted. A snakebite is usually characterized by extreme pain and swelling at the site of the bite. The manifestations of the bite include general weakness, rapid pulse, nausea and vomiting, shortness of breath, dimness of vision, tingling or numbness of the tongue, mouth and scalp, and shock. Medical assistance should be seeked immediately. First aid measures involve calming the victim, immobilization in a horizontal position so that the bitten body part is at or below the heart level. The victim should not walk, run, or take alcoholic beverages or stimulants. The victim should not be given aspirin. If the snake can be killed or captured without risk or delay, it should be transported to the hospital for identification. The bitten area may be washed with soap and water and blotted dry with sterile gauze.

The majority of reactions following contact with poisonous plants involve allergic reactions characterized by headache and fever, itching, redness, and a rash. The most distinctive feature of poison ivy and poison oak are their leaves, which are composed of three leaflets each. Both plants have greenish white flowers and berries that grow in clusters. Contact can result in a severe rash characterized by redness, blisters, swelling, and intense burning and itching. The victim can also develop a high fever and become very ill. Usually the rash will begin a few hours after exposure, but it has been known to be delayed for 24 to 48 hours. Lack of a reaction to these plants upon contact does not guarantee that future contact will also result in no reaction. When working in areas with poison ivy/oak/sumac, workers should wear long sleeved shirts and pants, gloves and boots. When working with a weed eater or when facial contact is of a concern, the use of a clear plastic hooded shield should be considered. Use of barrier creams are effective but require frequent application and may be rubbed and perspired off. Clothing which has come in contact with poisonous plants should be washed after each wearing with soap and water. Gloves, boots, and equipment should be sprayed with water and allowed to sit overnight. Water and air exposure breaks down the plant oil rendering it harmless. Employees should be careful when removing and donning contaminated gloves and clothing during the day and should be careful of wiping the face with contaminated gloves or clothing. Employees should wash their hands with soap and water after handling the outside of exposed clothes and gloves. If a rash develops, apply a soothing lotion such as calamine lotion. If a more severe reaction develops or if there is a known history of sensitivity, seek medical attention.

TABLE 2-1
HEALTH HAZARD QUALITIES OF HAZARDOUS SUBSTANCES OF CONCERN

Compound	PEL (ppm)	TLV (ppm)	IDLH (ppm)	Odor Threshold (ppm)	Ionization Potential (eV)	Physical Description/Health Effects/Symptoms
Aluminum	15 mg/m^3 (total) 5 mg/m^3 (respiratory)	NA 10 mg/m^3	NA	NA	NA	Bluish silver-white ductile and malleable metallic solid. Irritates eyes, lungs, and gastrointestinal tract. Causes coughing, shortness of breath, fibrosis, encephalopathy, dementia, and convulsions.
Anthracene	0.2 mg/m^3	0.2 mg/m^3	700 mg/m^3	NA	7.23	Colorless to yellow crystals with blue fluorescence. May irritate eyes, respiratory tract, skin.
Antimony	0.5 mg/m^3	0.5 mg/m^3	50 mg/m^3	NA	NA	Silver-white, lustrous, hard, brittle metal. Scale-like crystals or dark gray lustrous powder. Irritates skin, eyes, respiratory tract and may cause cardiac abnormalities.
Aroclor,-1242 (PCB, Chlorodiphenyl wi 42% Chlorine)	1 mg/m^3 (skin)	1 mg/m^3 (skin)	10 mg/m^3	NA	NA	Colorless to pale yellow, viscous liquid or solid with a mild hydrocarbon odor. Eye, skin irritant. Affects skin, eyes, liver. Carcinogen.
Aroclor,-1254 (PCB, Chlorodiphenyl wi 54% Chlorine)	0.5 mg/m^3 (skin)	0.5 mg/m^3 (skin)	5 mg/m^3	NA	NA	Colorless to pale yellow, viscous liquid or solid with a mild hydrocarbon odor. Eye, skin irritant. Affects skin, eyes, liver. Carcinogen.
Arsenic	0.01 mg/m^3 (inorg) (29 CFR 1910.1018) 0.5 mg/m^3 (org)	2 mg/m^3 4 mg/m^3 (STEL)	5 mg/m^3	NA	NA	Grayish-yellow, white or reddish gray crystalline powder. Silver gray or tin-white, brittle, odorless solid. Affects liver, kidneys, skin, lungs. Carcinogen.
Barium (soluble compounds as Ba)	0.5 mg/m^3	2 mg/m^3 4 mg/m^3 (STEL)	50 mg/m^3	NA	NA	Appearance and properties vary with specific compounds. Irritates eyes, skin, and upper respiratory tract. Causes gastroenteritis, muscle spasms, slow pulse and heartbeat irregularities.
Benzo(k)fluoranthene	0.2 mg/m^3	0.2 mg/m^3	700 mg/m^3	NA	NA	Pale yellow needle-like crystals. Carcinogen.
Benzo(g,h,i)perylene	0.2 mg/m^3	0.2 mg/m^3	700 mg/m^3	NA	NA	Large pale yellow-green plate-like crystals. Possible mutagen.

TABLE 2-1
HEALTH HAZARD QUALITIES OF HAZARDOUS SUBSTANCES OF CONCERN

Compound	PEL (ppm)	TLV (ppm)	IDLH (ppm)	Odor Threshold (ppm)	Ionization Potential (eV)	Physical Description/Health Effects/Symptoms
Benzo(a)pyrene	0.2 mg/m^3	0.2 mg/m^3	700 mg/m^3	NA	NA	Pale yellow crystalline solid with faint aromatic odor. Causes skin rash and thickening and discoloration of the skin. Mutagen, experimental teratogen, and carcinogen.
Beryllium	0.002 mg/m^3 (comp) 0.005 mg/m^3 (powders) 0.025 mg/m^3 (30 min max)	2 ug/m^3	4 mg/m^3	NA	NA	Hard, brittle gray-white metal. Irritates lungs, skin, eyes, and mucous membranes. Carcinogen.
Boron (as oxides)	15 mg/m^3	NA	2000 mg/m^3	NA	13.50 eV	Colorless, semitransparent lumps of hard, white, odorless crystals
Cadium (compounds as Cd)	0.005 mg/m^3	0.05 mg/m^3	9 mg/m^3	NA	NA	Silver white, blue tinged lusterous, odorless solid, odorless, yellow-brown in air.
Chromium metal	1 mg/m^3	0.5 mg/m^3	250 mg/m^3	NA	NA	Blue-white to steel gray lustrous, brittle, hard metal. Irritates respiratory system.
Chromium (II) and (III) Compounds (as Cr)	0.5 mg/m^3	0.5 mg/m^3	250 mg/m^3	NA	NA	Properties vary with compound. Irritates skin.
Chrysene	0.2 mg/m^3	0.2 mg/m^3	700 mg/m^3	NA	7.75 eV	Colorless crystalline solid with blue to red fluorescence. Causes burns to skin and eyes. Carcinogen.
Copper (dust/mists)	1 mg/m^3	1 mg/m^3	100 mg/m^3	NA	NA	Reddish, lustrous, odorless metal. Irritates eyes, nose and skin and causes a metallic taste. May affect liver and kidneys
Cobalt (as Co)	0.1 mg/m^3	0.2 mg/m^3	20 mg/m^3	NA	NA	Odorless, silver-gray to black solid
Cyanides (as CN)	5 mg/m^3	5 mg/m^3 (skin)	50 mg/m^3	NA	NA	White, granular or crystalline solid with a light almond-like odor. Asphyxia and death can occur; causes weakness, confusion, headache, vomiting, and respiratory symptoms. Skin and eye irritant.
Dibutylphthalate (Di-n-butylphthalate)	5 mg/m^3	5 mg/m^3	4000 mg/m^3	0.26	NA	Colorless to faint yellow, oily liquid with a slight, aromatic odor and strong, bitter taste. Irritates eyes, nose, throat and skin. May damage developing fetus and male reproductive organs.

TABLE 2-1
HEALTH HAZARD QUALITIES OF HAZARDOUS SUBSTANCES OF CONCERN

Compound	PEL (ppm)	TLV (ppm)	IDLH (ppm)	Odor Threshold (ppm)	Ionization Potential (eV)	Physical Description/Health Effects/Symptoms
Fluoranthene	0.2 mg/m^3	0.2 mg/m^3	700 mg/m^3	NA	NA	Pale yellow crystalline solid. Toxic by inhalation, ingestion, absorption. Causes burns to skin and eyes. Causes nausea, tachycardia, arrhythmias, liver injury, pulmonary edema, respiratory arrest. [ii/-] Carcinogen.
Ideno(1,2,3-cd)pyrene	0.2 mg/m^3	0.2 mg/m^3	700 mg/m^3	NA	NA	Yellow crystalline solid. Solutions show greenish-yellow fluorescence. Carcinogen.
Iron (as iron oxide dust and fume)	10 mg/m^3	5 mg/m^3	2500 mg/m^3	NA	NA	Reddish-brown solid. Targets respiratory system
Lead	0.05 mg/m^3 8 hour TWA	0.05 mg/m^3	100 mg/m^3	NA	NA	Heavy, ductile, gray metal. Irritates eyes and causes brain, kidney, blood, CNS, and digestive tract disorders. Symptoms include weakness, insomnia, abdominal pain, colic, constipation, anemia, wrist and ankle paralysis, and low blood pressure.
Magnesium (as Magnesium oxide fume)	15 mg/m3	10 mg/m^3	750 mg/m^3	NA	NA	Fine white particulate. Irritates eyes and nose. Causes coughing, chest pain, and flu-like fever. Fumes cause metal fume fever.
Manganese (as Mn)	5 mg/m^3 (ceiling)	0.2 mg/m^3	500 mg/m^3	NA	NA	Lustrous, brittle, silvery solid metal. Causes Parkinson's disease, loss of strength, insomnia, confusion, dry throat, coughing, rales, shortness of breath, tight chest, flu-like fever, lower back pain, vomiting, and fatigue. Fumes cause metal fume fever.
Mercury (aryl and inorganic)	0.1 mg/m^3 (ceiling) (skin)	0.025 mg/m^3 (skin)	10 mg/m^3	NA	NA	Silver-white, heavy, odorless liquid metal. Can cause irritation of skin and eyes, coughing, bronchitis, fatigue, weakness, weight loss, and headaches. Appearance and odor vary depending on the specific (organo) alkyl compound.
Mercury (alkyl)	0.01 mg/m^3 (skin)	0.01 mg/m^3 (skin)	2 g/m^3	NA	NA	
Mercury (vapor - all forms except	0.05 mg/m^3 (skin)	0.05 mg/m^3 (skin)	28 mg/m^3	NA	NA	Silver-white, heavy, odorless liquid / metal. Can cause irritation of skin and eyes, coughing, bronchitis, fatigue, weakness, weight loss, and headaches.
Methylene Chloride (Dichloromethane)	ST 125 mg/m^3	50 mg/m^3	2300 mg/m^3	25-320	11.3 eV	Colorless gas with faint sweet odor (not noticeable at dangerous concentrations). Causes nausea, vomiting, weakness, and headache. Carcinogen.

TABLE 2-1
HEALTH HAZARD QUALITIES OF HAZARDOUS SUBSTANCES OF CONCERN

Compound	PEL (ppm)	TLV (ppm)	IDLH (ppm)	Odor Threshold (ppm)	Ionization Potential (eV)	Physical Description/Health Effects/Symptoms
Nickel (as Ni)	1 mg/m^3	1.5 mg/m^3	10 mg/m^3	NA	NA	Lustrous, silvery, solid metal. Causes headache, nausea, vomiting, epigastric pain, cough, delirium, and convulsions. Carcinogen.
PCB (Aroclor 1254, Chlorod with 54% Chlorine)	0.5 mg/m^3 (skin)	0.5 mg/m^3 (skin)	5 mg/m^3	NA	NA	Colorless to pale yellow, viscous liquid or solid with a mild hydrocarbon odor. Eye, skin irritant. Affects skin, eyes, liver. Carcinogen.
PCB (Aroclor 1260, Chlorod with 60% Chlorine)	0.5 mg/m^3 (skin)	0.5 mg/m^3 (skin)	5 mg/m^3	NA	NA	Colorless to pale yellow, viscous liquid or solid with a mild hydrocarbon odor. Eye, skin irritant. Affects skin, eyes, liver. Carcinogen.
Perchlorethylene (Tetrachloroethene or PCE)	25 mg/m^3	100 mg/m^3	150 mg/m^3	5-50	9.3 eV	Colorless liquid with mild chloroform odor. Eye, nose, and throat irritant. Cumulative liver, kidney, and CNS damage. Carcinogen and suspected mutagen.
Phenanthrene	0.2 mg/m^3	0.2 mg/m^3	700 mg/m^3	NA	NA	Colorless, shining crystals; faint aromatic odor. Causes burns to skin and eyes. Carcinogen.
Pyrene	0.2 mg/m^3	0.2 mg/m^3	700 mg/m^3	NA	7.72 eV	Colorless to pale yellow crystalline solid. Solutions slightly bluish with blue fluorescence. Irritates eyes, skin, and throat. Carcinogen.
Selenium	0.2 mg/m^3	0.2 mg/m^3	1 mg/m^3	0.0002 mg/m^3	NA	Amorphous or crystalline, red to gray solid. Irritates eyes, skin, and upper respiratory system. Attacks liver, kidneys, and blood.
Tetrachloroethene (PCE) (Perchlorethylene)	100 mg/m^3	25 mg/m^3 100 mg/m^3 (STEL)	150 mg/m^3	5-50	9.3 eV	Colorless liquid with mild chloroform odor. Eye, nose, and throat irritant. Cumulative liver, kidney, and CNS damage. Carcinogen and suspected mutagen.
Thallium	0.1 mg/m^3 (skin)	0.1 mg/m^3 (skin)	15 mg/m^3	NA	NA	Appearance and properties vary with specific compound. Causes nausea, vomiting, diarrhea, abdominal pain, pulmonary edema, liver and kidney damage, loss of hair, spasms, incoordination, psychosis, drooping of upper eyelids, seizures, degeneration of nervous system and tingling and creeping sensations of skin on legs.
Trichloroethene (TCE)	100 mg/m^3	50 mg/m^3 100 mg/m^3 (STEL)	1,000 mg/m^3	21.4-400	9.45 eV	Clear colorless or blue liquid. Ethereal, chloroform-like odor. Skin and eye irritant. Causes headaches, vertigo, visual disturbances, tremors, nausea, vomiting, and cardiac arrhythmia. Carcinogen.

TABLE 2-1
HEALTH HAZARD QUALITIES OF HAZARDOUS SUBSTANCES OF CONCERN

Compound	PEL (ppm)	TLV (ppm)	IDLH (ppm)	Odor Threshold (ppm)	Ionization Potential (eV)	Physical Description/Health Effects/Symptoms
Vanadium (as vanadium pentoxide dust and fumes)	0.05 mg/m^3 (dust) 0.1 mg/m^3 (fume)	0.05 mg/m^3	35 mg/m^3	0.5-2.2 mg/m^3	NA	Yellow-orange powder or dark gray odorless flakes dispersed in air. Irritates eyes and throat. Causes green tongue, metallic taste, coughing, wheezing, bronchitis, rales, shortness of breath, and eczema.
Vinyl Chloride	1 mg/m^3 5 ppm (15 min max)	5 mg/m^3	NA	260	10.0 eV	Colorless gas (liquid < 56°F) with pleasant odor at high concentrations. Causes weakness, abdominal pain, and gastrointestinal bleeding. Attacks liver, CNS, blood, respiratory system, and lymphatic system. Carcinogen.
Zinc (based on zinc oxide)	5 mg/m^3 (fume) 15 mg/m^3 (total dust) 5 mg/m^3 (dust)	5 mg/m^3 (10 mg/m^3 STEL) 10 mg/m^3	500 mg/m^3	NA	NA	Fine, white, odorless particulate. Irritates respiratory system. Causes metallic taste, cough, chills, fever, tight chest, rales, headache, blurred vision, muscle cramps, nausea and vomiting.

TABLE 2-1
HEALTH HAZARD QUALITIES OF HAZARDOUS SUBSTANCES OF CONCERN

Compound	PEL (ppm)	TLV (ppm)	IDLH (ppm)	Odor Threshold (ppm)	Ionization Potential (eV)	Physical Description/Health Effects/Symptoms

a/ PEL = Permissible Exposure Limit. OSHA-enforced average air concentration to which a worker may be exposed for an 8-hour workday without harm. PELs published in 29 CFR 1910.1000, 1997. Expressed as parts per million (ppm) unless noted otherwise. Some states (such as California) may have more restrictive PELs Check state regulations.
b/ TLV = Threshold Limit Value - Time-Weighted Average. Average air concentration (same definition as PEL, above) recommended by the American Conference of Governmental Industrial Hygienists (ACGIH), 1993-1994.
c/ IDLH = Immediately Dangerous to Life or Health. Air concentration at which an unprotected worker can escape without debilitating injury or health effects. Expressed as ppm unless noted otherwise.
d/ When a range is given, use the highest concentration.
e/ Ionization Potential, measured in electron volts (eV), necessary to determine if field air monitoring equipment can detect substance.
f/ mg/m3 = milligrams per cubic meter.
g/ NA = Not available.
h/ Recommended values.
i/ (skin) = Refers to the potential contribution to the overall exposure by the cutaneous route.
j/ Olfactory fatigue has been reported for compound and odor may not serve as warning property.
k/ mR/hr = mrem/hr = Milliroentgen equivalent in man per hour.
l/ STEL = Short Term Exposure Limit; a 15 minute time-weighted average that should not be exceeded at any time during the work day.
m/ f/cc = fibers per cubic centimeter.
n/ Respirable fraction.
o/ Total dust
p/ Ceiling concentration which should not be exceeded at any time.
q/ Based on exposure limits for petroleum distillates (naphtha).
r/ LD50 = median lethal dose; mg/kg = milligrams per kilogram.
s/ Irritation threshold.
t/ Based on fume.
u/ Airborne exposure limit (AEL) developed by United Stated Department of the Army.
v/ Dulls senses.
w/ NIOSH recommends reducing exposure to lowest feasible concentration.
x/ Based on dust.
y/ Refer to expanded rules for this compound.
z/ Total dust containing no asbestos and less than 1% crystalline silica.
aa/ Soluble salts.
bb/ Depends upon variety.

SECTION 3
EMPLOYEE TRAINING

SECTION 3

EMPLOYEE TRAINING

3.1 GENERAL TRAINING REQUIREMENTS

All Parsons personnel will have completed 40 hours of training in Hazardous Waste Operations plus three days of supervised field experience in accordance with 29 CFR 1910.120 (e), and will have completed the required eight-hour refresher training, on an annual basis. In addition, each field team will have Parsons personnel trained in first aid. The Parsons Field Team Leader will be experienced with the types of field operations to be employed at the referenced site. The Field Team leader shall also have Supervisory training in accordance with 29 CFR 1910.120 (e).

3.2 SITE SPECIFIC TRAINING

The Site Safety Officer will be responsible for developing a site specific occupational hazard training program and for providing training to all Parsons personnel that are to work at the site. Contractors performing various tasks at the site, and subcontracted through Parsons, will be present at the site-specific occupational hazard training program meetings. Meeting minutes will be recorded in the Project Field Log Book, and will include the names of all personnel present, date and time of meeting, and topics discussed. The training will consist of the following:

- Names of personnel responsible for site safety and health;
- Site Communication System to be used at the Site;
- Safety, health and other hazards at the site;
- Proper use of personal protective equipment;
- Work practices by which the employee can minimize risk from hazards;
- Safe use of engineering controls and equipment on the site;
- Acute effects of compounds at the site (how to recognize signs and symptoms of overexposure);
- Decontamination procedures; and
- Location of nearest hospital, Site Health and Safety Plan, MSDSs, fire extinguishers, and First-Aid Kit.

Furthermore, any client-specific health and safety requirements will be discussed.

On a day-to-day basis, individual personnel should be constantly alert for indications of potentially hazardous situations and for signs and symptoms in themselves and others that imply hazardous conditions or exposures. Rapid recognition of dangerous situations can avert

emergencies. Before daily work assignments, regular meetings should be held. Discussion should include:

- Tasks to be performed.
- Time constraints (e.g., rest breaks, cartridge changes).
- Hazards that may be encountered, including their effects, how to recognize symptoms and monitor them, concentration limits, or other danger signals.
- Emergency procedures.
- Location of nearest hospital, Site Health and Safety Plan, MSDSs, fire extinguisher and first-aid kit.

SECTION 4
PERSONAL PROTECTIVE EQUIPMENT

SECTION 4

PERSONAL PROTECTIVE EQUIPMENT

4.1 PERSONAL PROTECTIVE EQUIPMENT AND ACTION LEVELS

Direct reading instruments required for monitoring employee exposure at hazardous waste investigation sites include either a photoionization detector (PID) or a flame ionization detector (FID) and colorimetric tubes (as appropriate). The PID and FID are used to evaluate total volatile organic vapors in air, whereas the colorimetric tubes are used to assure compliance with the compound specific permissible exposure limits (see Table 2.1). Colorimetric tubes must be capable of detecting the specified action level for the specific compound. All air readings must be collected in the worker's breathing zone.

Instruments that rely on ionization technology to measure volatile organic vapors, determine concentration by using proportional algorithms to relate concentration of volatile organic vapors detected to a known concentration of calibration gas. Thus, the accuracy of the instrument is dependent on how closely the ionization potential of the calibration gases resembles the ionization potential of the vapors present in the air. For most work on hazardous waste investigation sites, the zero gas used will be ambient air, since it contains all of the components (including water vapor) of clean breathing-zone air. The span gas will usually contain isobutylene in a standard concentration (usually 100 ppm). Isobutylene is selected due to the fact that the molecule has a similar ionization potential as benzene. Due to the slight differences in ionization potential between span gas and the compound being monitored for, the readings given by the PID or FID are not precisely equivalent to parts-per-million. The units indicated by the instrument are, in fact, isobutylene-equivalent units. These units are comparable to parts-per-million for compounds that are similar to isobutylene.

Table 4.1
Action Levels

Instrument	Action Level Instrument Reading	Action
PID/FID	< 25	Level D PPE
PID/FID	>1, < 100	Colorimetric monitoring for vinyl chloride.
PID/FID	>25, < 100	Colorimetric monitoring for methylene chloride.
PID/FID	> 100, < 500	Level C PPE
PID/FID	> 500	Level B PPE
Vinyl chloride colorimetric tube.	> 1, < 10	Level C PPE

Table 4.1
Action Levels

Instrument	Action Level Instrument Reading	Action
Vinyl chloride colorimetric tube	> 10	Level B PPE
Methylene Chloride colorimetric tube	> 25	Level B PPE
Combustible Gas	> 10 % LEL	Cease activities
% Oxygen	< 19.5 %	Use SCBA (supplied air)

Level D protection will consist of:

- Standard work clothes
- Safety boots (must be worn during drilling and excavation activities)
- * Safety glasses or goggles (must be worn for bailing)
- * Nitrile gloves (must be worn during all sampling activities)
- * Hard hat (must be worn during drilling and excavation activities)

* Optional, except as indicated.

Level D protection shall only be used when:

- total volatile organic vapor readings on the PID or FID are less than the specified action level, and
- compound specific colorimetric tube concentrations are less than the specified action levels.

Colorimetric tube monitoring must be done when the specified monitoring action level is reached.

The level of personal protection will be upgraded to Level C if any of the following conditions are met:

- concentration of volatile organic vapors reach the specified action levels for a period greater than 30 seconds, and
- colorimetric tube concentrations are less than the specified action levels.

Level C protection will consist of:

- Standard work clothes
- Full-face air-purifying respirator
- Combination dust/organic vapor cartridges

- Tyvek® coveralls, or equivalent chemical protective clothing (CPC)
- nitrile inner and nitrile outer gloves
- Butyl rubber boots, steel toe and shank
- Hard hat (must be worn during drilling activities)

* Optional, except as indicated.

In the event that the concentration of total volatile organic compounds exceed the specified action levels, personnel will back-off from the area and consult the Office Health and Safety Representative. Any work performed in areas with these concentrations will require Level C protection.

The Site Safety Officer may either evacuate workers or upgrade to a Level B protective ensemble when:

- total volatile organic vapor readings in the breathing zone are above the specified action levels for a period greater than 30 seconds, or
- colorimetric tube concentrations in the breathing zone exceed the specified action levels.

All personal protective equipment used during the course of this field investigation must meet the following OSHA standards:

Type of Protection	Regulation	Source
Eye and Face	29 CFR 1910.133	ANSI Z87.1-1968 If purchased after July 5, 1994: ANSI Z87.1-1989
Respiratory	29 CFR 1910.134	
Head	29 CFR 1910.135	ANSI Z89.1-1969 If purchased after July 5, 1994: ANSI Z89.1-1986,
Foot	29 CFR 1910.136	ANSI Z41.1-1967 If purchased after July 5, 1994: ANSI Z41-1991,

ANSI = American National Standards Institute

Both the respirator and cartridges specified for use in Level C protection must be fit-tested prior to use, in accordance with OSHA regulations (29 CFR 1910.134).

Air purifying respirators cannot be worn under the following conditions:

- Oxygen deficiency
- IDLH concentrations
- High relative humidity
- If contaminant levels exceed designated use concentrations.

SECTION 5
MEDICAL SURVEILLANCE

SECTION 5

MEDICAL SURVEILLANCE

5.1 MEDICAL SURVEILLANCE

Parsons will utilize the services of a licensed Occupational Health Physician with knowledge and/or experience in the hazards associated with the project. The Physician will provide the medical examinations and surveillance described herein.

Personnel involved in this operation have undergone medical surveillance prior to employment at Parsons, and yearly, thereafter as required for working under OSHA 1910.120. Medical certification regarding the fitness or unfitness of employees to perform activities on hazardous waste projects will be provided, and will include any restrictions on the employee's utilization for given tasks. This evaluation will be repeated as indicated by substandard performance or evidence of particular stress that is evident by injury or time loss illness on the part of any worker. Personnel who will be wearing respirators will be certified as being fit to do so by the Physician.

SECTION 6

FREQUENCY AND TYPES OF AIR MONITORING, PERSONNEL MONITORING, AND ENVIRONMENTAL SAMPLING TECHNIQUES

SECTION 6

FREQUENCY AND TYPES OF AIR MONITORING, PERSONNEL MONITORING, AND ENVIRONMENTAL SAMPLING TECHNIQUES

6.1 MONITORING REQUIREMENTS

6.1.1 Routine Monitoring

Monitoring for organic vapors in the breathing zone will be conducted with a Photovac Microtip photoionization detector (PID) or equivalent. Readings will be taken under the following circumstances:

- Upon initial entry onto the site;
- When weather conditions change;
- When work begins on another portion of the site;
- Every five feet during drilling; and
- Every hour during excavation activities, or when changes occur in subsurface soils.

Because of the grinding involved when concrete saws are required, there is a potential for spark generation. To ensure that an explosive atmosphere is not present during site activities, air monitoring for combustible gases/vapors will be conducted. A combustible gas indicator is used to determine the concentration of flammable vapors in the air. Guidelines have been established by OSHA concerning the action levels to be utilized when working in a potentially explosive environment.

Guidelines on the use of the combustible gas indicator are as follows:

- 10 Percent LEL - limit all activities in area.

When readings exceed 10 percent LEL on the indicator all activities must cease to allow time for the combustible gases to vent.

6.1.2 Displacement of Combustible Gases

If the explosive/combustible concentrations of gases in the well/borehole are not diminished after allowing adequate time to vent, then the following steps should be taken.

1. Obtain an air compressor (minimum 1.5 horsepower).
2. **WARNING: AN AIR COMPRESSOR MAY BE A SOURCE OF IGNITION;** therefore, place compressor a safe distance from the well/borehole (at least 20 feet) Use an LEL when determining the safe location for the compressor.
3. Place hose into the well/borehole until it reaches bottom.
4. Start air compressor and "run" it for 15 minutes.
5. Measure the percent LEL in the well/borehole. If explosive reading continues above 20 percent LEL, repeat Step 3. If level of combustible gases/vapor in the well are now below 20 percent LEL, proceed with Step 6.

6. Monitor well/borehole for five minutes with combustible gas indicator; if readings remain below 10 percent LEL, continue with drilling or split-spoon sampling activities.
7. Continue monitoring explosive gas concentrations in borehole.

6.1.3 Oxygen Monitoring:

NIOSH requires the use of self-contained breathing apparatus when oxygen concentrations fall below 19.5 percent. This condition would be very unlikely since there should be no activities performed in confined work spaces. However, should the situation change, an oxygen indicator should be used to monitor the atmospheric O_2 concentration, during initial site entry and drilling activities.

NOTE: The combustible gas indicator is intended for use only in normal atmospheres, not ones that are oxygen enriched or deficient. Oxygen concentrations that are less than or greater than normal may cause erroneous readings.

All monitoring equipment used during these studies must be certified for operation in a Class I atmosphere. A Class I atmosphere consists of flammable vapors and gases, such as gasoline and hydrogen. The instrument's instruction manual contains information on the use of the instrument in an explosive atmosphere.

6.1.4 Personnel Monitoring

Based on the contaminants of concern and the levels expected, no personnel monitoring is planned.

SECTION 7
SITE CONTROL MEASURES

SECTION 7

SITE CONTROL MEASURES

7.1 SITE WORK AREA

Figure 7-1 shows the location of the soil boring and sampling activities, groundwater well installation, groundwater sampling, surface water sampling, and stream sediment sampling.

7.2 SITE WORK ZONES

Site work zones will be delineated in order to reduce the spread of hazardous materials from the contaminated areas to the clean areas. The establishment of the work zones will help ensure that: personnel are properly protected against the hazards present where they are working, work activities and contamination are confined to the appropriate areas, and personnel can be located and evacuated in an emergency. The Site Work Zones will be established in the field. The work is anticipated to be performed in Level D PPE, and therefore the whole site does not need to be considered an exclusion zone.

7.2.1 Exclusion Zone

Exclusion zones will be established at the facility for all drilling activities. The Exclusion Zone will be the area immediately around the drill rig, and unprotected onlookers should be located at least 20 feet upwind of drilling activities. In the event that volatile organic vapors are detected in the breathing zone at levels which exceed the Action Levels discussed in Section 4.1, all personnel within the Exclusion Zone must don Level C protection. Should this contingency arise, the Exclusion Zone will be expanded to at least 50 feet. Each site must be evaluated to determine the limits of the exclusion zone required for the site and the activities to be performed.

All personnel within the Exclusion Zone will be required to use the level of protection specified in Section 4.1. No food, drink, or smoking will be allowed in the Exclusion or Decontamination Zones.

7.2.2 Decontamination Zone

Should it be necessary to utilize Level C protection, a decontamination zone will be utilized. This zone will be established between the Exclusion Zone and the Support Zone, and will include the personnel and equipment necessary for decontamination of equipment and personnel (discussed below). Personnel and equipment in the Exclusion Zone must pass through this zone before entering the Support Zone. This zone should always be located upwind of the Exclusion Zone.

7.2.3 Support Zone

The Support Zone will include the remaining areas of the job site. Break areas, operational direction and support facilities (to include supplies, equipment storage and maintenance areas) will be located in this area. No equipment or personnel will be permitted to enter the Clean Zone from the Exclusion Zone without passing through the personnel or equipment decontamination station(s). Eating, smoking and drinking will be allowed only in the Support Zone.

7.3 BUDDY SYSTEM

The "buddy system" will be enforced. In the event that only one Parsons employee is present at the site, the subcontractor will serve as the "buddy" for the Parsons employee, and vice versa.

7.4 SITE COMMUNICATION

A Site Communication System shall be established by the Field Team Leader during the initial Site visit for each event/activity conducted at the Site.

7.5 ACCIDENT PREVENTION

Accident prevention is an integral part of all site activities. In order to accomplish this goal, all field personnel will receive health and safety training (40-Hour HAZWOPER training, per 29 CFR 1910.120(e)), prior to the initiation of any site activities. These training requirements are provided in Section 3, and will not be repeated in this section. On a day-to-day basis, individual personnel should be constantly alert for indications of potentially hazardous situations and for signs and symptoms in themselves and others that imply hazardous conditions or exposures. Rapid recognition of dangerous situations can avert emergencies. Before daily work assignments, regular meetings should be held. Discussion should include the items listed in Section 3.2

In addition to the necessary safety measures appropriate to site-specific conditions, equipment used at the site and the work to be accomplished, the following measures will be taken to prevent unnecessary injury:

- The Site Safety Officer will review the site conditions, and make necessary adjustments to work practices if a potentially dangerous condition is identified.
- The "buddy system" will be enforced. In the event that only one Parsons employee is present at the site, the subcontractor will serve as the "buddy" for the Parsons employee, and vice versa.
- Air monitoring will be conducted, and will be appropriate to the site and to the tasks at hand.
- Good housekeeping procedures will be observed. No food or beverages will be consumed in the work area. In addition, chewing gum and tobacco will be prohibited in

the work area, and the work area will be kept free of debris, which might result in trip and fall hazards.

- Contaminated materials shall be contained, and disposed of in accordance with applicable regulations.
- All potentially hazardous/flammable/combustible work areas will be monitored with a explosimeter (combustible gas meter), photo/flame ionization detector (PID/FID), and colorimetric tubes for explosive conditions and hazardous atmospheres. The action levels are provided in Section 4.
- Personnel and equipment shall follow decontamination procedures provided in Section 8.

The Site Safety Representative will provide on-site supervision of any contractor, subcontracted by Parsons, to ensure that the subcontracted personnel are meeting the Health and Safety requirements set forth in this Plan. If deficiencies are noted, work will be stopped and corrective action will be taken (e.g., retain or purchase additional safety equipment). Reports of health and safety deficiencies and corrective actions taken will be forwarded to the Project Manager and will be entered in the Project Field Log Book.

7.5.1 Drilling

Prior to any drilling activities, efforts should be made to determine whether underground installations will be encountered and, if so, where these installations are located (see Section 2.2.3). An on-site health and safety meeting will be attended by all personnel working at the site, including subcontractors (required topics of discussion are presented in Section 3.2).

Hard hats and safety boots must be worn within 20 feet of the drill rig. Additional personal protective clothing may be required to ensure the safety of site personnel (see Section 4.1 for further discussion). The minimum power line clearance for drill rig operation is dependent on the voltage of the power line in accordance with the applicable OSHA regulations. A drill rig should never be operated at a distance of less than 10 feet from overhead power lines, however, greater distances may be required (refer to 29 CFR 1910.333, 29 CFR 1926.550).

The Site Safety Officer will provide on-site supervision of the drilling subcontractor to ensure that subcontracted personnel are meeting the health and safety requirements set forth in this Plan. If deficiencies are noted, work will be stopped and corrective action will be taken (e.g., retrain, purchase additional safety equipment). Reports of health and safety deficiencies and corrective actions taken will be forwarded to the Project Manager, and will be entered in the Project Field Log Book.

7.5.2 Groundwater Sampling

The Site Safety Officer will ensure that entry into any Exclusion Zone is controlled to make certain that personnel entering this zone utilize the proper personal protective equipment. Periodic air monitoring will be conducted to determine if the concentration of chemical constituents in the breathing zone has changed during activities at the site. The Site Safety

Officer will keep the emergency telephone numbers (telephone numbers of the physicians, hospitals, ambulances, etc.) in a conspicuous area. Members of the Field Team will be trained in emergency contingencies, and in good housekeeping practices (i.e., disposal of materials, location of first aid equipment, etc.). Constant monitoring of field activities will be performed to ensure compliance with the Site Health and Safety Plan.

7.5.3 Excavations

Prior to any on-site activity, efforts should be made to determine where underground utilities may intersect the excavation area (see Section 2.2.3). An on-site health and safety meeting will be attended by all personnel working at the site, including subcontractors (required topics of discussion are presented in Section 3).

No person shall enter a tank hole excavation, or any other excavation deeper than four feet, unless the walls are shored or sloped, as prescribed by 29 CFR 1926 Subpart P (see Section 2.2.4). If state or local requirements are more restrictive than these specifications, the state or local requirements will take precedence.

An underground storage tank (UST) is defined as a Confined Space. In the event that any UST must be entered, procedures specified in 29 CFR 1910.146 must be followed. A reprint of this regulation is included in this Plan as Appendix E. See Section 10 for additional requirements for confined space entry.

LEGEND:

- PROPERTY LINE
- FENCE LINE
- EXISTING STRUCTURES
- FORMER STRUCTURES
- FORMER STORAGE AREAS
- SUMP
- MONITORING WELL
- DESTROYED MONITORING WELL
- PROPOSED SEDIMENT/ SURFACE WATER SAMPLE
- PROPOSED SHALLOW MONITORING WELL
- PROPOSED DEEP MONITORING WELL
- PROPOSED SOIL BORING
- PROPOSED SOIL BORING WITH GROUNDWATER SAMPLE
- D DEEP WELL
- STM STORM SEWER LINE

N

40 20 0 40

SCALE IN FEET

EAST BRANCH BLACK RIVER

FLOW

BOTT. OF BANK

TOP OF BANK

STORM SEWER OUTFALL PIPE

3" STEEL PRODUCT PIPE

12" CLAY TILE OUTFALL PIPE

10" CORR. STL. OUTFALL PIPE

3' HIGH CONC. FOUNDATION

ASSUMED BOTT. OF BANK

HEAVY VEGETATION

MW-1

MW-2

MW-3

MW-4

FORMER BRIGHTEN STILL BLDG.

FORMER ABOVE-GROUND STORAGE TANK AREA

FORMER DRUM STORAGE AREA 1

FORMER DRUM STORAGE AREA 4

FORMER TANKER STAGING AREA 1

FORMER TANKER STAGING AREA 2

FORMER DRUM STORAGE AREA 2

FORMER DRUM STORAGE AREA 3

(5) UST VENTS ON HARSHAW PROPERTY

ENGLEHARD COMPANY

WAREHOUSE AND OFFICE

M & M ALUMINUM SIDING

6" CAST IRON PIPE

FORMER BUILDINGS

RODNEY HUNT STILL BLDG.

FORMER RODNEY HUNT STILL BLDG.

GATE 8

LOCUST STREET

WELL L-2 LOCATED 98' SOUTH OF M&M ALUM. SIDING BLDG.

L-3

By	Description	Date	Rev
		7/22/02	

Job No. 741012.02000
Designed
Drawn SBM
Checked
Reviewed
Approved
Reg. No.
Date

Issue Certification

NOT FOR BIDDING OR CONSTRUCTION

PARSONS

OFFICES IN PRINCIPAL CITIES

19101 VILLAVIEW ROAD, SUITE 100
CLEVELAND, OHIO 44119
PHONE (216) 481-1605
FAX (216) 481-1119

124 LOCUST STREET
ELYRIA, OHIO

CRS SUPERFUND SITE
ELYRIA, OHIO

PROPOSED SAMPLING LOCATIONS

FIGURE NO. 7-1

REV.

P:\CRS Su Site\Cadd\41012N23.dwg, Layout1, 02/25/03 10:51:38 AM, 1:2.05

SECTION 8
DECONTAMINATION PROGRAM

SECTION 8

DECONTAMINATION PROGRAM

8.1 DECONTAMINATION

8.1.1 Decontamination of Personnel

Limited decontamination will be necessary if only Level D protection is used. Disposable gloves used during sampling activities should be removed and bagged, and personnel should be encouraged to remove clothing and shower as soon as is practical at the end of the day (all clothing should be machine-washed). All personnel will wash hands and face prior to eating, before and after using the restroom, and before leaving the site.

More comprehensive decontamination will be necessary if Level C or higher protection is used. The following OSHA-specified procedures include steps necessary for complete decontamination prior to entry into the Support Zone, and steps necessary if a worker only needs to change a respirator or respirator canister. Modification can be made to the twelve station decontamination process depending upon the extent of contamination. If Level C PPE is required, the decontamination procedures will be inspected by the Project Health and Safety Officer.

Station 1: Segregated Equipment Drop

Deposit equipment used in Exclusion Zone (tools, sampling devices and containers, monitoring instruments, clipboards, etc.) on plastic drop cloths or in designated containers with plastic liners. Each will be contaminated to a different degree depending on use. Segregation at the drop reduces the probability of cross-contamination.

Station 2: Suit/Safety Boot and Outer-Glove Wash

Thoroughly wash safety boots and outer-gloves. Scrub with long-handle, soft-bristle scrub brush and large amounts of Liquinox™ (or equivalent)/water solution. Necessary equipment includes:

1. Wash tub (30 gallon or large enough for person to stand in)
2. Liquinox™ (or equivalent)/water solution
3. Long-handle, soft-bristle scrub brushes

Station 3: Suit/Safety Boot and Outer-Glove Rinse

Rinse off Liquinox™/water solution using large amounts of water. Repeat as many times as necessary. Necessary equipment includes:

1. Wash tub (30 gallon or large enough for person to stand in)
2. Spray unit
3. Water
4. Long-handle, soft-bristle scrub brushes

Station 4: Outer Gloves Removal

Remove the outer gloves and deposit in individually marked plastic bags. Necessary equipment includes:

1. Plastic bag

Station 5: Respirator HEPA Cartridge Respirator Mask Change

If a worker leaves the Exclusion Zone to change a respirator cartridge (or mask), this is the last step in the decontamination procedures. The worker's cartridge is exchanged, new outer glove donned, and joints taped. Worker returns to duty. Otherwise the worker proceeds to Station 6. Necessary equipment includes:

1. Respirator cartridges appropriate for site conditions (or mask)
2. Tape
3. Boot covers
4. Gloves

Station 6: Removal of Chemically-Resistant Suit and Disposable Boot Covers

With assistance of helper, remove suit. Deposit in container with plastic liner. Necessary equipment includes:

1. Container with plastic liner.

Station 7: Inner-Glove Wash

Wash inner gloves with Liquinox™ (or equivalent)/water solution. Repeat as many times as necessary. Necessary equipment includes:

1. Liquinox™ (or equivalent)/water solution
2. Wash tub
3. Long-handle, soft-bristle scrub brushes

Station 8: Inner-Glove Rinse

Rinse inner-gloves with water. Repeat as many times as necessary. Necessary equipment includes:

1. Water
2. Wash tub

Station 9: Respirator Removal

Remove facepiece. Avoid touching face. Wash respirator in clean, sanitized solution, allow to dry and deposit facepiece in plastic bag. Store in clean area. Necessary equipment includes:

1. Plastic bags

2. Sanitizing solution
3. Cotton

Station 10: Inner-Glove Removal

Remove inner gloves and deposit in container with plastic liner. Necessary equipment includes:

1. Container with plastic liner

Station 11: Field Wash

Wash hands and face. Necessary equipment includes:

1. Water
2. Soap
3. Tables
4. Wash basins or buckets
5. Clean towels

Station 12: Redress

If re-entering Exclusion Zone, put on clean field clothes (e.g., Tyvek(R), gloves, etc.). Necessary equipment includes:

1. Table
2. Clothing

8.1.2 Equipment Decontamination

Drill rigs will be steam cleaned and drilling equipment will be decontaminated prior to moving to a site. Drilling equipment used for multiple boreholes will be decontaminated prior to drilling each boring at the site. The equipment will be decontaminated in the following manner:

- The drilling rig will be cleaned of gross soil contamination.
- Downhole equipment (auger bits, drill rods, split-spoons, etc.) will be steam cleaned to remove gross contamination.
- Lastly, the downhole equipment will be air dried.

A drilling sequence hierarchy (from less likely to more likely contaminated boring locations) will be imposed to reduce the potential for cross-contamination.

All sampling equipment will be decontaminated prior to use at each sampling location. The methodology used to decontaminate sampling equipment is similar to that used for downhole equipment; the exception being that the first step, steam cleaning, is not necessary for decontaminating sampling equipment.

SECTION 9
EMERGENCY RESPONSE PLAN

SECTION 9
EMERGENCY RESPONSE PLAN

9.1 EMERGENCY RESPONSE CONTINGENCY PLAN

9.1.1 Emergency Procedures

In the event that an emergency develops on site, the procedures delineated in this Section are to be followed. Emergency contacts are recorded on Page i of this Plan, and a map showing the site location and location of the nearest hospital is provided on Page ii. These pages should be posted in a prominent location at the site.

Emergency conditions are considered to exist if:

- Any member of the field crew is involved in an accident or experiences any adverse effects and/or symptoms of exposure.
- A condition is discovered that suggests that a situation more hazardous than anticipated has developed.

General emergency procedures, and specific procedures for personal injury and chemical exposure, are described below.

9.1.2 Chemical Exposure\Personal Injury

If a member of the field crew is injured or demonstrates symptoms of chemical exposure, the procedures outlined below should be followed:

- Emergency actions will be initiated by the first person recognizing the emergency situation.
- The area around the victim should be assessed, and the cause of injury/illness should be determined before the injured person is approached.
- If the cause of the injury has been determined, and can be deactivated (e.g., engaging the "kill switch" on a drill rig, de-energizing electrical power, etc.), this action should be taken immediately.
- Once the nature of the emergency is known, the following agencies will be notified:
    - Hospital
    - Ambulance
    - Poison control (where applicable)
    - Fire department (where applicable)
    - Police and/or sheriffs department (where applicable)

- If the injuries are severe, the victim should be moved, only if movement is necessary to avoid further injury (if the cause of the injury has been deactivated, as may be the case in trauma accidents, and the location of the injured person is no longer immediately dangerous, the victim should be moved only by medical emergency personnel).
- The victim should be removed from the immediate area of contamination only after the proper personal protective equipment is donned, and the cause of injury (if mechanical or electrical) is deactivated.
- The Site Safety Officer will be notified as soon as possible. This individual will, in turn, notify the Office Health and Safety Representative and the Site Project Manager as soon as possible. The Project Manager will contact the client who will then contact the U. S. EPA Region V.
- If an injury or illness is the result of suspected chemical exposure, steps will be taken to identify the chemical, and this information will be provided to the emergency medical staff.
- Precautions should be taken to avoid exposure of other individuals to the chemical.
- If the chemical is on the victim's clothing, the chemical should be neutralized or removed, if it is safe to do so.
- If the chemical has contacted the skin, the skin should be washed with copious amounts of water.
- In case of eye contact, an emergency eye wash should be used. Eyes should be washed for at least 15 minutes.
- All chemical exposures must be reported in writing to the Office Health and Safety Representative. The Site Safety Officer is responsible for completing the accident report (See Appendix D).
- In the case of spills, catastrophe or accidents, the appropriate state or federal agencies will be notified (i.e., EPA).

9.1.3 Non-Life Threatening Personal Injury

In case of non-life threatening personal injury at the site, the following procedures should be followed:

- A field team member trained in first aid can administer treatment to an injured worker. A first-aid kit will be present at the site during all site activities and must be located in a conspicuous place at the site.
- The victim should then be transported to the nearest hospital or medical center. If necessary, an ambulance should be called to transport the victim.
- For less severe injuries, treatment is at the victim's discretion, however, even minor injuries should be reported to the Office Health and Safety Representative, so that the appropriate action may be taken in the event that complications develop later, as a result of the injury.
- The Site Safety Representative is responsible for making certain that an Accident Report Form is completed. This form is to be submitted to the Office Health and Safety Representative. Follow-up action should be taken to correct any situations that may have caused the accident.

9.1.4 Evacuation Procedures

- The Site Safety Officer will initiate evacuation procedures by signaling to leave the site.
- All personnel in the work area should evacuate the area and meet in the designated area.
- All personnel suspected to be in or near the contract work area should be accounted for, and the whereabouts of missing persons determined immediately.
- Further instructions will then be given by the Site Safety Officer.

9.1.5 Procedures Implemented in the Event of a Major Fire, Explosion, or On-Site Health Emergency Crisis

- Notify the Emergency Medical Staff and/or Fire Department, as necessary.
- Signal the evacuation procedure previously outlined and implement the entire procedure.
- Isolate the area.
- Stay upwind of any fire.
- Keep the area surrounding the problem source clear after the incident occurs; and
- Complete Accident Report Form and distribute to appropriate personnel.

SECTION 10
CONFINED SPACE ENTRY PROCEDURES

SECTION 10

CONFINED SPACE ENTRY PROCEDURES

10.1 PERMIT REQUIRED CONFINED SPACE ENTRY PROCEDURES

Permit Required Confined Space Entry Procedures involve the use of certified, trained individuals, and OSHA-approved equipment. Permit-Required Confined Space Entry will not be attempted unless certified, trained individuals and required equipment are employed. If the only hazard associated with the confined space is atmospheric, and the hazardous atmosphere can be eliminated with engineering controls, the space can be re-classified as a Non-Permit Required Confined Space. Reclassification can only be done after the hazard is eliminated, and the space must be continuously monitored to ensure that hazardous atmospheric conditions do not develop, requiring re-classification of the space as a Permit-Required Confined Space. If the subcontractor needs to enter a Confined Space, the subcontractor is required to provide trained personnel and monitoring equipment, as specified in 29 CFR 1910.146.

In the event that any confined space must be entered, procedures specified in 29 CFR 1910.146 must be followed, as applicable. A reprint of this regulation is included in this Plan as Appendix E.

Confined space entry is <u>not</u> anticipated for this Project.

SECTION 11
SPILL CONTAINMENT PROGRAM

SECTION 11

SPILL CONTAINMENT PROGRAM

11.1 SPILLS OR RELEASES

Spills, leaks, or releases that are limited to the Exclusion Zone do not represent a significant new hazard above and beyond the normal hazards associated with investigation activities. They require notification of the Parsons Project Manager but do not require implementation of emergency response procedures. Such events include leaks, spills, or releases which are contained within a spill containment area (a bermed area or curbed pad, etc.) or which can be contained and cleaned up promptly by site personnel with available on-site equipment. Such spills will be cleaned up according to procedures outlined below.

11.2 SPILL CONTROL PROCEDURES

Control of the cleanup of a spill or release will be directed by the Field Team Leader if the area of contamination is limited to the site. Off-site spills are not expected to occur during the investigation activities. The recovery, containment, treatment, and disposal of spilled materials will be performed only after the safety of all involved personnel is assured and the release of hazardous materials has stopped.

At a minimum, the following procedures be implemented during the cleanup:

- Ensure that all persons not participating in the emergency response are outside of hazard or spill areas;
- Apply the appropriate safety considerations to the use of protective clothing and equipment in the spill or release zone;
- If a flammable liquid is involved in the spill, remove all ignition sources from the area and monitor for explosive conditions with an explosimeter during the cleanup;
- Remove any surrounding materials that might chemically react with the spilled materials;
- Remove any remaining waste materials from the defective or leaking container, and transfer to an appropriate location;
- Use absorbent pads, Fuller's earth, sand, and/or other inert materials to clean up the spill if it has gone beyond existing containment equipment;
- Pump spilled free liquids into a drum(s) with available capacity using an intrinsically safe pump if the liquid is flammable; and
- Place contaminated cleanup and spill control materials in drums or bins. Dispose of these materials as appropriate.

11.3 CLEANUP AND MAINTENANCE AFTER A SPILL OR RELEASE

In the event of a spill or release, any visually detectable spill shall be collected and cleaned up. Soils that become visibly contaminated shall be excavated. Backfill, if required, shall be with clean soil. Equipment and other non-earthen materials that come into contact with the spilled material shall be decontaminated like any other piece of equipment that is taken out of the Exclusion Zone.

Any materials that become contaminated as a result of a spill or release from the site that cannot be decontaminated shall be disposed of at a licensed hazardous waste landfill or staged for subsequent disposal, as appropriate. On-site storage capabilities shall be provided as required for the disposal of any spilled or released wastes.

After a spill or release, emergency response materials and equipment shall be cleaned and checked to insure that they are available for use and are in good operating order. Equipment and supplies shall be replaced as required. An inspection of all safety equipment will be performed prior to the resumption of operations.

APPENDIX C
AIR MONITORING EQUIPMENT: CALIBRATION AND MAINTENANCE

APPENDIX C
AIR MONITORING EQUIPMENT
CALIBRATION AND MAINTENANCE

INTRODUCTION

All monitoring instruments must be calibrated and maintained at a frequency greater than or equal to the manufacturer's recommendations. The limitations and possible sources of errors for each instrument must be understood by the operator. It is important that the operator ensures that the instrument responds properly to the substances it was designed to monitor. Below are the calibration and maintenance procedures for the Photovac photoionization detector and Biosensor™ II combustible gas indicator.

PHOTOIONIZATION DETECTOR (PID)

The photoionization detector must be calibrated each day prior to use in the field. If the field activities are to exceed more than one day, a spare battery should be provided. A calibration gas (100 ppm isobutylene) will be taken into the field to perform routine calibration. There are two PIDs which are commonly used, the Photovac 2020 Photoionization Air Monitor and the Photovac MICROTIP.

Calibration procedures for the Photovac 2020 Photoionization Air Monitor are as follows:

1. Turn the instrument on. If the "low bat" indicator appears, the battery must be charged prior to using (time to full recharge is approximately 16 hours). Allow the instrument several minutes for the pump to come on and for the ion cell to come into equilibrium.

2. Disconnect the probe from the 2020. Press the ENTER key. Select "Set", "Cal", and then "Mem". Select the desired Cal Memory for the span gas. Select "Chng" and then "User". Enter a name for the calibration memory. Press the ENTER key and enter a response factor. Press the ENTER key and enter an alarm level foe each mode. Connect the supply of zero air. Calibration (zeroing) is to be done in a clean environment.

3. Fill the plastic bladder with calibration gas (not too full) and attach it to the Photovac via Teflon™ tubing and locking nut. Allow a moment for equilibration, then select "Set", "Cal", and "Zero". The 2020 sets its zero point. Select "Set", "Cal", and "Span". The 2020 asks for the span gas concentration. Enter the known span gas concentration, without pressing the ENTER key to confirm it. Open the bag and then connect the gas bag adapter to the inlet. Press ENTER. The 2020 sets its response factor. Do not allow the 2020 to evacuate the bag completely. When the display reverts to the default display, the 2020 is calibrated and ready for use. Then detach the plastic bladder from the inlet.

4. Recheck zero.

5. Record results of the calibration in logbook.

Calibration procedures for the Photovac MICROTIP are as follows:

1. Turn the instrument on. If the "low bat" indicator appears, the battery must be charged prior to using (time to full recharge is approximately 16 hours). Allow the instrument several minutes for the pump to come on and for the ion cell to come into equilibrium. When instrument status indicates "Ready", continue to Step 2.

Note: Before zeroing the MICROTIP, fill the plastic bladder with calibration gas (usually isobutylene-in-air, 100 ppm).

2. Zero the instrument. If zero air is used, fill another plastic bladder with zero air and attach it to the MICROTIP via a Teflon™ tubing and locking nut. Press the SETUP key on the instrument control panel, and select the desired Cal Memory. Press the EXIT key to leave the setup menu. Press the CAL Key to expose the MICROTIP to zero air (Note: if ambient air is to be used as Zero Air, just expose the MICROTIP to ambient air - no plastic bladder is necessary). Press the ENTER key, and the MICROTIP will set the zero point.

3. The MICROTIP asks for the Span Gas concentration. Enter the known Span Gas concentration, and connect the plastic bladder containing Span Gas to the MICROTIP via a Teflon™ tubing with locking nut. Press the ENTER key and the MICROTIP sets its sensitivity.

4. When the MICROTIP display reverts to normal display, MICROTIP is finished calibration. Remove Span Gas bladder from MICRO-TIP, and recheck zero.

5. Record results of the calibration in logbook.

In general, the ambient operating range of temperatures for the Photovac 2020 and MICROTIP is 0-43 °C (32-110 °F). The manufacturer does not recommend use of the Photovac outside this range although successful use has been reported. When the Photovac is taken from a low temperature into a region of higher temperature and humidity, a film of condensation will form on the UV lamp. This will result in a temporary loss of response which is best remedied by allowing the instrument to recover while running the pump. To avoid this, the manufacturer suggests that the user allow the instrument to equilibrate to ambient temperature before turning it on. Recommended maintenance for the Photovac is listed below:

- Routine maintenance for TIP* is absolutely minimal; all that is required is to ensure the batteries remain close to full charge (during periods of non use), the lamp window is cleaned every 24 hours of operation, and that the inlet filter is kept clear of dust particles and replaced every week (2020) or every 240 hours of operation (MicroTip).
- Occasionally, loss of TIP* sensitivity may require servicing of the detector and this is almost always limited to simply cleaning or changing the lamp/ion cell assembly.
- Periodically, it will be necessary to install new, rechargeable batteries, which can be expected to last for one year of heavy use.

- The plastic parts of TIP* can be cleaned with a damp cloth and mild detergent, if necessary. DO NOT use any organic solvents as the finish may be damaged.

Filter Replacement

TIP's* response can be tested with and without the filter and if the response varies by more than 10 percent, the filter should be replaced. In order to replace the filter cartridge, simply hold the filter housing firmly at the base with a 9/16" wrench and unscrew the 1/8" Swagelok connection, from the sample inlet at the top of the housing, with another 9/16" wrench. Discard the old filter and replace with the new one. Screw the sample inlet connection firmly into its place. Never use the instrument without the filter as the detector can be damaged.

Detector Maintenance

Further maintenance operations, which can be performed by the user, involve the cleaning of the ion chamber and the UV lamp window or replacement of the lamp itself. If the instrument has been used for extended periods in dusty environments or if there is a significant loss of sensitivity, and is not due to an obstructed filter, and the UV lamp and ion chamber will require examination.

For further instruction, consult the users manual.

BIOSENSOR™ II COMBUSTIBLE GAS INDICATOR

The combustible gas indicator calibration must be calibrated each week. The procedure for calibrating the combustible gas indicator calibration is listed below:

1. Attach the 0.5 liter per minute fixed flow rate regulator to the calibration gas cylinder.

2. Attach a sample line from the regulator to the balloon inlet. Attach another sample line from the balloon outlet to the sample draw intake on the instrument.

3. Fill the balloon with calibration gas and allow the sample draw pump to draw it over the sensors. DO NOT OVERINFLATE BALLOON! Feed more gas into the balloon as needed to keep it partially inflated.

4. Wait for the readings to stabilize. Then, using a small jeweler's screwdriver, adjust the "gas span" pot to obtain a steady reading which corresponds to the calibration gas concentration that is printed on the label of the calibration gas cylinder. (Normally 50% LEL).

5. Remove calibration lines.

6. Let the instrument run for one full minute to flush any excess calibration gas and check readings. The combustible sensor should be reading 000% LEL (±001% LEL), in fresh air. Repeat calibration procedures if necessary.

Combustible calibration complete.

The Biosensor™ II uses a 2-volt lead gel cell battery. This battery should be changed daily or as use dictates. The battery cannot be overcharged.

FLAME IONIZATION DETECTOR (FID)

The flame ionization detector must be calibrated and maintained at a frequency greater than or equal to the manufacturer's recommendations. See the manufacturer's operation and maintenance manual for instructions.

ATTACHMENT B

Response to U.S. EPA Region V Comments on
Parsons, Inc.'s First Revision Quality Management Plan
Prepared for its work at the Chemical Recovery Systems Site, Elyria, Ohio

Comment:

1. **Management and Organization, Section 1.**

1. The QMP approval page should specify that this document applicable to Ohio Operations, which includes Cleveland, Ohio office.

Response:

1. The document would be applicable to any Parsons personnel working on the Chemical Recovery System project, regardless of their location. It is not applicable just to Ohio Operations. Therefore, no changes to the signature page are provided.

Comment:

2. Section 0, page 1, forth paragraph. Region 5 Instructions on the Preparation of a Superfund Division Quality Assurance Project Plan (June 2000) should be referenced in addition to USEPA Requirements for Quality Assurance Project Plans (QA/R-5).

Response:

2. The document referenced is not the document to which the CRS QAPP was written. U.S. EPA previously informed the CRS Group not to use the referenced document as a guidance (see e-mails from Thomas Nash to Douglas McWilliams dated 29 August 2002 and 3 September 2002). QA/R-5 is the document that is referenced in the AOC as the guidance document to be used for QAPP preparation. Therefore, no changes to this Section are provided.

Comment:

3. Figure 1 should be Parsons organizational chart. EPA should be removed from this chart.

Response:

3. EPA has been removed from the Figure.

Comment:

4. Section 1.3.1, second bullet. The responsibility of QAO is to oversee preparation of the *project-specific QMP*. QMP is a document that describes a quality system in terms of the organizational structure, policy and procedures, functional responsibilities of management and staff, lines of authority, and required interfaces for those planning, implementing, documenting, and assessing all activities conducted. The only differences between QMPs may be the name of personnel, not policies. The QAPP should be site specific, not QMP. Please address.

Response:

4. The words "project-specific" have been deleted.

Comment:

5. Section 1.4, first bullet. EPA Order 5360.1 A2, May 2000 should be included in the referenced material.

Response:

5. This Order has been added to the list of standards listed in the first bullet.

Comment:

6. The process for dissolving disputes should be described/referenced.

Response:

6. A cross-reference to Sections 9.7 and 9.8 has been added in Section 1.5.

Comment:

2. Quality System Components, Section 2.

1. Section 2.3. Vice President and Director of Quality have overall responsibility for QA related services within Parson. These two individuals are not part of the organizational chart. Please provide explanation.

Response:

1. This one person has been added to the organizational chart and the text of Section 1.2. The reference to the person being a Vice President in the Corporation has been deleted as future DOQ's may not hold that title.

Comment:

3. Planning, Section 7.

1. Section 7.2 should reference Region 5 Instructions on Preparation of a Superfund Division QAPP, June 2000.

Response:

1. See response to Section 1 comment 2. No changes to this Section are provided.

Comment:

2. This section should identify the acceptance criteria for results or measurements of performance by which customer satisfaction will be determined.

Response:

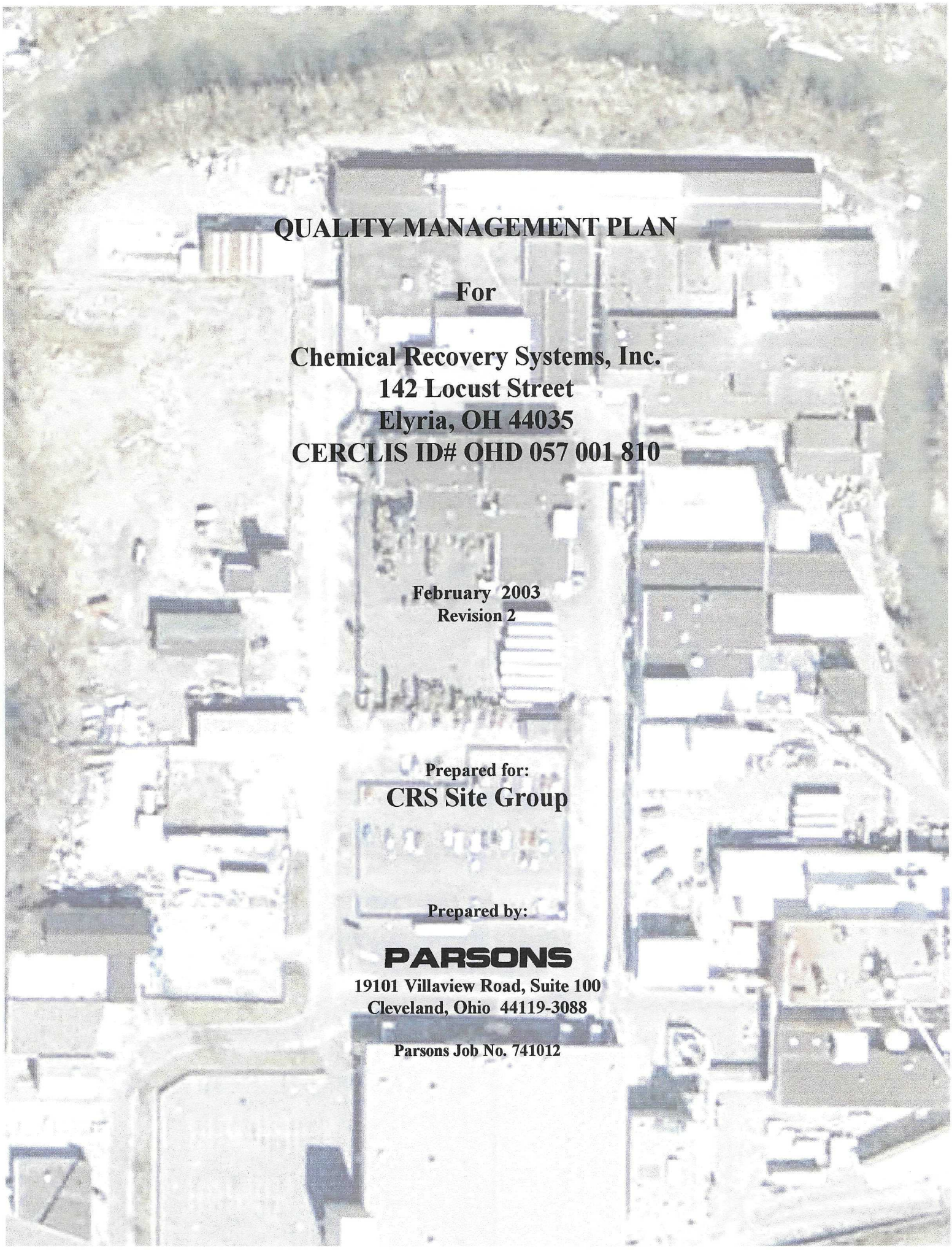
2. An additional Section has been added to Section 7 to address this issue.

PARSONS INC. QUALITY MANAGEMENT PLAN
Prepared for
Chemical Recovery Systems Site
142 Locust Street
Elyria, OH 44035
CERCLIS ID# OHD 057 001 810

February 2003
Revision 2

Summary of Inserts
(All pages are replacement pages)

Item	Location
Color Cover	Inside Front Outside Plastic Pocket
Title Page	First page inside report
Table of Contents (pages ii – iv)	after Title page and page i
Section 1 (pages 3 – 15)	Replace Section in entirety
Section 2, Page 19	last page in Section
Section 7, page 36	last page in Section



QUALITY MANAGEMENT PLAN

For

Chemical Recovery Systems, Inc.
142 Locust Street
Elyria, OH 44035
CERCLIS ID# OHD 057 001 810

February 2003
Revision 2

Prepared for:
CRS Site Group

Prepared by:

PARSONS
19101 Villaview Road, Suite 100
Cleveland, Ohio 44119-3088

Parsons Job No. 741012

QUALITY MANAGEMENT PLAN

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Appendix A Standard Forms

SECTION 1
MANAGEMENT AND ORGANIZATION

The purpose of this section is to document the overall policy, scope, applicability, and management responsibilities of the organization's quality system.

Parsons has developed a QA program based on a corporate philosophy of providing clients with cost-effective, technology-based services, striving for continuous improvement of quality in order to exceed the client's goals and expectations. The program depends on the performance of every employee and the oversight of several key staff. The QA program for Parsons is actively managed by key senior-level staff. This section of the QMP describes the management and organization of the QA program to be implemented for the CRS RI/FS Project.

1.1 QUALITY ASSURANCE POLICY STATEMENT

Parsons views QA as a management discipline that begins with effective work planning in close conjunction with the client and culminates with a carefully constructed set of checks and balances designed to ensure that uncertainty has been reduced to the lowest practicable level. Although it consists of requirements and procedures, Parsons QA is regarded as a discipline whose end result is *validated, verifiable, and well-documented information.* Our "Quality Policy" Statement is as follows:

> "The Parsons Quality Assurance Program is based on the premise that quality is the responsibility of every member of the organization and that effective planning is the cornerstone to the achievement of acceptable quality. An adequate QA program must contribute to, and guide, the organization in the orderly approach to designing and building in quality. It must assist the organization and individuals to recognize that quality is built into an item or service, not inspected into it. Quality, reliability, performance, and personal and environmental safety are paramount objectives of an acceptable quality assurance program."

Through our experience in environmental consulting, data gathering, and monitoring activities, Parsons is aware of the necessity to institute programs to ensure the integrity and defensibility of technical data.

Consistent with the goals of the QA policies of the USEPA and other organizations, the goal of the QA program within Parsons is to ensure that all environmental data obtained for clients will be scientifically valid, defensible, and of known quality. This goal can be attained by (1) including QA plans and resources as part of the initial planning for data collection or analysis tasks, (2) incorporating specified QA procedures into the entire work process (from initial studies through data collection, evaluation, and application). Thus, the Parsons QA Policy includes the following objectives:

- Establish project and QA goals in close coordination with the client, at the onset of work planning.
- Develop and implement QA and QC activities at the onset of each work assignment effort.
- Ensure that technical work products generated for each work assignment are complete, accurate, and delivered on time; suitable for their intended purpose; and comply with all appropriate professional standards.
- Any analytical data generated over the course of a work assignment are of a quality and quantity suitable for sound statistical treatment and scientific analysis, and can withstand close regulatory and legal scrutiny.
- For all preliminary, conceptual, or detailed design activities, that all appropriate technical and procedural standards are followed for calculations, drawings, or specifications.
- All QA/QC procedures are systematically re-evaluated over the course of a work assignment, so that deficiencies are identified and resolved in a timely manner.
- QA/QC review processes are well documented and distributed to appropriate internal parties so that QA "lessons learned" may be translated into future work assignments.

We also recognize that quality on a case-by-case basis must be defined within the context of the use of that process or product. Thus, the level of quality management applied to a given activity must consider the project's relative importance, the risk of a decision error, the schedule for completion, and the available resources.

Technical problems can be minimized through careful planning, precise scheduling, utilization of well-qualified staff, and clear and constant communication among project team members and client representatives.

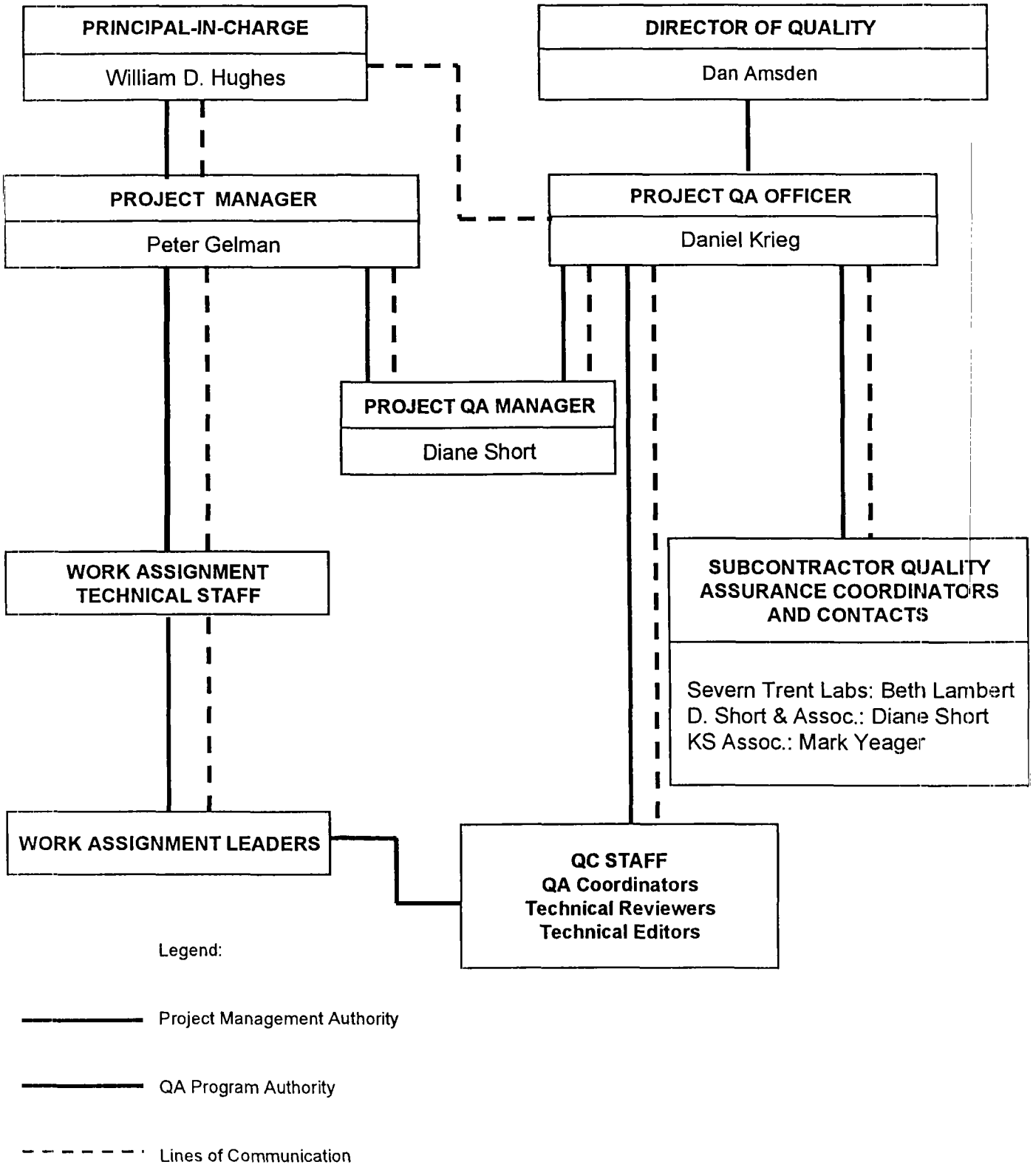
1.2 QUALITY ASSURANCE STAFF ORGANIZATION

As shown in Figure 1, the Parsons' QA program consists both of dedicated quality system staff, as well as program and work assignment staff and functional groups that produce deliverables and generate measurement data.

Parsons quality system stresses that quality is everyone's responsibility. Our dedicated quality system staff work alongside, although independently, of the program and project staff.

Key project QA personnel are the Director of Quality (DOQ); the QA Officer (QAO); the QA Manager, the QC Staff (e.g., Technical Reviewers, Technical Editors); and subcontractor QA Coordinators or Contacts (QACs). Key personnel for project and work assignment management include the Principal-in-Charge (PIC), Project Manager (PM), and Work Assignment Leaders (WALs). All personnel share responsibility for producing quality products.

FIGURE 1
PARSONS PROJECT ORGANIZATION AND ITS
RELATIONSHIP TO THE QUALITY ASSURANCE ORGANIZATION



The DOQ, Dan Amsden, has overall responsibility for QA related services within Parsons. He also coordinates with office and project Quality Assurance Managers to assure QA resources are adequate for specific projects.

The PIC, Mr. William D. Hughes, is appointed by PI&T's President and Chief Executive, Mr. J.A. Scott, and has ultimate responsibility for the quality of work performed under this project. As Vice President, based in Parsons' Cleveland, Ohio, office, Mr. Hughes provides senior technical and management oversight and has the authority to commit company resources to develop a proactive quality system and to take corrective actions whenever necessary. The PIC selects the PM, Mr. Peter Gelman, and QAO, Mr. Daniel Krieg for the Project. The PM reports directly to the PIC. As management staff, the PM acts with the authority of the PIC on all project-related matters and provides senior technical management oversight to ensure the quality of all work performed under the project.

The QAO is responsible for seeing that the quality assurance program is followed, and interacts with the PM regarding quality issues for all work assignments under the project. The QAO also serves as management staff advisor to the PIC and acts with the authority of the PIC on all QA-related matters for the project. The QAO develops and maintains the QA program based on the QMP for the project. The QAO provides direction and guidance to the subcontractor QACs and the QA/QC staff, and through them, to the technical and administrative personnel completing the work. The QAO, following consultation with the PM, has authority to suspend the performance of any activities determined to be deviating from the established QMP, work plan, or QAPP until appropriate corrective actions can be instituted.

The PM selects the WAL for each work assignment specified under the project. The WAL implements quality procedures during the period of performance of the work assignment to provide quality products and services as specified in the SOW for each work assignment, including producing all deliverables. The WAL and the PM discuss any concerns about quality with the client and with the QAO to identify and resolve problems or to implement correct actions, if needed, and works with the PM and QAO to identify and to implement quality improvements. The PM and WALs are responsible for overseeing the work performed by the Work Assignment Technical Staff and providing assurance that all required QC procedures are being implemented. All work assignment technical staff are responsible for complying with the QMP, work plan, QAPP, standard operating procedures (SOPs), and other guidance provided to produce quality materials for the work assignment.

Each subcontractor or consultant that performs work for Parsons appoints a QAC, who is responsible to the QAO for verifying that work assigned to the subcontractor on work assignments is completed in accordance with project QA/QC requirements. The QAC also serves to ensure that any corrective action resulting from an audit is implemented.

The QA/QC Staff consists of those persons who are responsible for monitoring day-to-day implementation of the quality program, perhaps within the context of specific work assignments, and are authorized to ensure that the requirements of the QA program are implemented and maintained in accordance with project requirements and Parsons' QSPP. The QA/QC Staff carry out the important functions of QC checks and QA audits, and work with the

QAO and WALs to identify and implement quality improvements. The QA/QC Staff includes, but is not limited to, QA Coordinators, Technical Reviewers, and Technical Editors.

The QAO monitors all activities and assists the WALs in QA evaluations, reviews and approves project- and work assignment-specific quality-related documents (as described later in Section 2.0 and 5.0), and verifies compliance with orders and recommendations to the PM, WALs, and subcontractor QACs on corrective actions. The QAO may appoint QA Coordinators, as necessary, to ensure quality assurance for work assignments involving data systems management, field sampling or monitoring, or data compilation/validation. The QAO also communicates with USEPA's project QAO to resolve problems. The PIC works with the QAO to track Parsons' overall performance, to determine whether major corrective actions are needed, and with the PM to resolve QA issues. These established interactions among the PIC, PM, QAO, QACs, QA/QC Staff, WALs, and work assignment technical staff ensure that each work assignment receives proper QA attention from the planning stages through completion.

The Quality Assurance (QA) Manager is specifically responsible for the quality assurance associated with the QAPP and will be responsible for monitoring the data validation of the sample results from the analytical laboratory as described in the QAPP and for approving the corrective action measures taken in the event an activity is found to be deficient and ensuring that all appropriate data is validated as described in the QAPP. The QA Manager will interact primarily with the Project Manager.

1.3 QUALITY ASSURANCE STAFF RESPONSIBILITIES

The role of senior personnel in the QA program is to share their experience and provide quality review of work assignment deliverables. Specific responsibilities of the key QA and project management personnel are described in the following sections.

1.3.1 Quality Assurance Officer (QAO)

The QAO, Mr. Daniel Krieg, is responsible for implementation of the QMP under the project and provides direction and guidance to the QA/QC Staff and subcontractor QACs. Specific responsibilities of the QAO include the following:

- Serves as management staff advisor to the PIC.
- Oversees preparation of the QMP and subsequent revisions.
- Implements QA policy and guidelines for project activities.
- Ensures that all WALs are informed about the QMP and the quality system under which their work assignments will operate for the project.
- Assigns QA Coordinators (QACs), as appropriate, to specific work assignments.
- Directs and oversees the project QA program to ensure the quality of all data and reports generated under the project, including assisting WALs in identifying

appropriate technical and editorial reviewers or other specialists who might be required.

- Reviews work plans to ensure that appropriate QA and QC documentation and approaches are incorporated into the work plan for each work assignment.
- Reviews and approves work assignment-specific QA procedures and standard operating procedures (SOPs; see Section 2).
- Communicates with subcontractor QACs, as needed and with appropriate notification of Parsons and subcontractor management, to ensure that subcontractor QC activities and QA procedures are consistent with project or work assignment requirements.
- Provides technical direction on QA procedures to staff and subcontractors.
- Audits work assignment activities, including QA reviews, documentation procedures, and technical operations, as required.
- Conducts or assists in annual management system reviews.
- Reports nonconformance situations to the PM and, as appropriate, with notification of Parsons and subcontractor management, to subcontractor QACs.
- Initiates, reviews, and verifies compliance with orders and recommendations to the PM, WALs, and subcontractor QACs on corrective actions for all aspects of work that do not meet program standards.
- Communicates regularly with QA/QC Staff, supervising their QA responsibilities and compiling quality improvement opportunities for review with the PM; communicates quality improvement opportunities to subcontractor QACs by appropriate notification of Parsons management; and assists all work assignment staff in implementing such improvements to benefit the overall QA program.
- Communicates with the EPA's QAO to resolve any problems.

1.3.2 QA Manager

The QA Manager, Ms. Diane Short, is responsible for the quality assurance associated with the QAPP as detailed out in the QAPP. The Project QA Manager will be responsible for monitoring the data validation of the sample results from the analytical laboratory as described in the QAPP. The Project QA Manager will be responsible for approving the corrective action measures taken in the event an activity is found to be deficient and ensuring that all appropriate data is validated as described in the QAPP.

1.3.3 QA/QC Staff

The QA/QC Staff consists of those persons who are responsible for monitoring day-to-day implementation of the quality program and are authorized to ensure that the requirements

of the QA program are implemented and maintained in accordance with project requirements and with Parsons' corporate policies and procedures. The QA/QC Staff carries out the important functions of QC checks and QA audits. The staff includes, but is not limited to, QACs, Technical Reviewers, or Technical Editors.

QACs are selected and appointed by the QAO and the PM, as needed, for work assignments involving, for example, field sampling, laboratory analysis, and data processing. The QAC works closely with the person responsible for doing the work as the work is being done. The QAC has sufficient technical background to understand the tasks to be done, as described in the QAPP and SOPs, and to be able to reliably perform the checks required. Specific responsibilities include:

- Provide oversight and ensure that work is conducted according to plan and completed; that measurements are taken properly; and that samples are analyzed, data are entered, calculations are performed, and software or models operate correctly.
- Provide written and signed documentation that the work or information has been checked, as directed by the QAO (e.g., prepare short reports, complete checklists, sign logs, initial calculations).

Technical Reviewers provide peer review oversight on the content of work products, usually after the work has been done. The Technical Reviewers include experts in science, engineering, water resource management, economics, geology, hydrology, policy, or other disciplines. These experts can be drawn from Parsons staff or from our complement of technical consultants, depending on the nature of the specific work assignment. Usually one or more Technical Reviewers participate in one or more levels of review, depending on the materials produced and specific requirements of the work assignment as described in the work plan. The persons performing these reviews should not have had any part in the original production of the document or analysis of the samples (i.e., they did not write the document or analyze the data). These reviews might include internal or outside peer reviews of document, validation of data, verification of the operation of software, final evaluation of documents and deliverables, or other verification of product quality. Specific responsibilities of Technical Reviewers include the following:

- Ensuring that material used in or provided for a product is correct, consistent, and complete and meets the objectives of the client.
- Participating in quality control by checking the quality of the product or service against the predetermined standard for quality required by the client, including determining whether data are entered correctly, calculations have been performed correctly, software or models operate correctly, and samples have been analyzed correctly; and that facts are correctly stated and issues discussed appropriately for the specific scientific, engineering, or policy topic under consideration.
- Participating in additional reviews and audits to ensure that the product or service meets or exceeds the client's specifications, including final evaluation of documents

and deliverables to ensure that all revisions have been addressed or incorporated or to otherwise verify product quality.

- Providing written and signed documentation that the information has been checked.

Technical Editors oversee production of written materials, particularly regarding format, correct usage, and style. They ensure that authors follow the project style guide and comply with client format requirements. They work closely with the WALs. Specific responsibilities include the following:

- Developing and implementing procedures for the flow of work products through various phases of technical and editorial review.
- Ensuring that various iterations of any deliverable submitted for editing are properly edited and that all editorial corrections are incorporated to improve readability and clarity.
- Performing quality checks of deliverables to ensure that appropriate style and format guidelines are being followed consistently, that grammar and spelling are correct, and that consistency of products is maintained through checks of the written material against predetermined requirements for format, style, and usage.

1.3.4 Quality Assurance Coordinator (QAC)

Each subcontractor that provides products or services for a particular project agrees to abide by the terms and conditions of Parsons' QMP when performing work for Parsons, as stated in the subcontracting agreement. Each subcontractor appoints a QAC, who is responsible for all QC and QA requirements particular to each work assignment for which the subcontractor's services are required. The QAC reports directly to the QAO and must adhere to Parsons' program to ensure that rigorous QA/QC standards are met. Specific responsibilities of the QAC include the following:

- Provide the QAO with subcontractor-specific QA policies and procedures in the form of a written QMP, when requested.
- Review the project QMP and ensure that all work assignment personnel are following all QA/QC requirements specified in the QMP, as well as sound engineering and scientific practices.
- Prepare QAPPs for work assignments on which the subcontractor has primary responsibility for sampling, analysis, measurement, or data collection efforts.
- Review and approve QAPPs for work assignments on which the subcontractor has secondary responsibility for sampling, analysis, measurement, or dam collection efforts.
- Verify that all data collection activities are covered by approved QAPPs.

- Ensure that all routinely used sampling and analysis procedures are described in approved SOPs.
- Ensure that no deviations from approved QAPPs, SOPs, or other relevant work assignment documents occur without proper authorization and documentation.
- Observe control procedures for quality-related documents, as indicated.
- Conduct audits of work performed by the subcontractor.
- Assist management in solving QA problems, as needed, and ensure that any corrective action resulting from a performance or system audit conducted under the project or any quality improvement communicated by the WAL to subcontractor management is carried out and documented.

1.3.5 Principal-in-Charge (PIC)

The PIC provides senior technical and management oversight to ensure the quality of all work performed under this project. Specific responsibilities of the PIC include the following:

- Appoints the PM and QAO for the project. Note: Within Parsons, the PM were appointed when the proposal for the project was prepared. If, due to resignation or reassignment, a new PM or QAO is needed during the period of performance of the project, the client and EPA would be notified and the PIC would then appoint a suitably qualified staff member to that position.
- Review and approve the project QMP.
- Work with the PM and QAO to identify and resolve QA issues.

1.3.6 Project Manager (PM)

The PM establishes the QA program for the project and implements the QMP. Specific responsibilities of the PM include the following:

- Review and approve the project QMP.
- Assign appropriately qualified personnel and equipment to each work assignment to ensure that quality objectives addressed in the work plan are attained.
- Work with the PIC to determine compliance with procurement regulations.
- Review work plans.
- Provide senior-level direction and review of work assignment deliverables, as needed.
- Assist the QAO in resolving issues that cannot be handled by WALs and in resolving issues with subcontractors, if necessary.

- Monitor compliance with orders and recommendations to WALs regarding corrective action and project-specific quality improvement opportunities.
- Ensure client satisfaction on all work assignments by maintaining regular contact with client and resolving any client concerns.

1.3.7 Work Assignment Leader (WAL)

The WAL directs the day-to-day operations of a work assignment and is responsible for implementing quality procedures and producing all deliverables for a work assignment. Specific responsibilities of the WAL include the following:

- Prepare and execute the work plan and QAPP (if any). Ensure that funding for work assignment activities is included in the work plan and that the work assignment is completed in conformance with all QA requirements of the QMP and QAPP.
- Assign staff and subcontractors to tasks.
- Monitor the budget and work assignment schedule.
- Verify that document control procedures specified for the work assignment are followed and maintain pertinent documentation for the work assignment; assign a Document Control Specialist (DCS), if needed, to compile and organize large quantities of materials so that they are accessible to staff and submitted to the client and regulators when required.
- Ensure that QC activities are conducted as specified for the work assignment (e.g., technical reviews, proofreading, technical editing, and QC checks of field operations and analyses).
- Ensure that all suggested quality improvements (e.g., comments, corrections, revisions, deletions, additions) are incorporated into the deliverables.
- Ensure that products have received appropriate QA review (e.g., data validation, software operational review, final evaluation), as specified in the work plan before they are delivered to the client.
- Approve all data and documentation before transmittal to the client through the signing of a transmittal letter (to be done by the WAL or designee).
- Discuss any concerns about deliverable quality with the client and work with the QAO to resolve problems.
- Work with the PM and QAO to identify and implement quality improvements.

TABLE 1
THE AUTHORITY AND RESPONSIBILITIES OF QA PERSONNEL

PERSON/GROUP	RESPONSIBILITY	REPORTS TO	COORDINATES WITH
Project Quality Assurance Officer (QAO)	Program QA/QC Receives QA Reports Conducts Audits Attends WA Kickoff Meetings Reviews and Approves Corrective Actions	Parsons Project Manager USEPA QAO	EPA QAO Parsons Subcontractor QACs WA QA Coordinator (QAC)/QC Staff Parsons Project Manager Parsons WAL
Project QA Manager	Approved QAPP Monitors Data Validation Approves QAPP Corrective Actions	Parsons Project Manager	Parsons Project Manager Parsons WAL Parsons Project QAO
Project Manager	Project Oversight Allocates Resources Manages Project Institutes Project Procedures Tracks Expenditures Reviews Work Plans Tracks Schedules	Parsons PIC	Parsons Project QAO Parsons QAC Parsons WAL Client USEPA QAO
Technical Advisors/ Peer Reviewers	Identifies Quality Objectives Reviews Documents	Parsons Project Manager	Parsons PIC Parsons Project Manager Parsons WAL
Work Assignment Quality Assurance Coordinator (QAC) (for projects with field data component)	Prepares QAPP Prepares QC Reports Monitors QC Activities Conducts Audits Plans/Oversees Correction Action	Parsons Project QAO	Parsons WAL Project Staff Parsons Project QAO
Work Assignment Leader (WAL)	Project Management Prepares Work Plans Approves QAPP Ensures Budget, Schedule, Quality Adherence	Parsons Project Manager	Parsons Project Manager Client Parsons Project Team Parsons QAC
Laboratory/Field Director	Implements QC Procedures Documents QC Activities Prepares QA/QC Reports Directs Corrective Action	Parsons WAL	Parsons Project Manager Client Parsons Project Team

1.3.8 Work Assignment Technical Staff

All work assignment staff are responsible for complying with the QMP, work plans, QAPPs, SOPs, and other guidance provided to produce quality materials for the work assignment. Specific responsibilities of the Work Assignment Technical Staff include the following:

- Performing high-quality work, to the best of their abilities, and seeking additional help as needed to make sure that materials prepared are accurate and complete.
- Maintaining complete, legible, permanent, and defensible records documenting all work performed.

1.3.9 Summary

Table 1 summarizes the roles, major responsibilities, and organization interrelationships of the Parsons QA Staff.

1.4 QUALITY SYSTEM ACTIVITIES

There are basically three types of QA programs that are developed and implemented by Parsons for programs and projects. They include:

- Project-specific QA programs required by contract and regulatory statues that are required to meet specific standards such as ANSI/ASME NQA-1, DOE Order 5700.6C, ISO 9000, 10 CFR 830.120, ANSI/ASQC E4, EPA-QAMS 005/80, EPA Order 5360.1 A2, May 2000, or other institute or government standards.
- Project-specific QA programs required by the client and developed based on accepted QA principles and practices, but not necessarily driven by formal standards (generally developed for major projects).
- A generic, office-wide QA program that is based on the QA principles described in this policy manual (generally developed for multiple smaller projects).

In some cases, a combination of the above three types of programs may be used to meet customer needs. For example, developing a QA program using an institute or government standard plus client-specific QA requirements.

Project specific QA programs will be developed by project, office, or divisional staff using institutional standards or programs developed specifically for the project. All remaining projects will fall within the QA plan set forth in this company QA policy manual.

As determined by Parsons project management, the application of QA requirements and the intensity with which they are applied will be tailored to each project or activity. Early in the planning stages of each project, project management, assisted by the QA staff, will perform a quality evaluation to establish potential risk and the necessary quality program required for all

aspects of the project. Based on the evaluation, quality assurance plans will be prepared, tailoring the applicable QA program requirements to that project.

1.5 ASSURANCE OF QUALITY SYSTEM IMPLEMENTATION

Senior and project management will implement a system of planned and documented audits and/or assessment to verify whether quality activities comply with planned arrangements and to determine the effectiveness of the quality system. The level and extent of this audit and assessment program will be based on the complexity and risk of the system, activity, or project involved. In addition:

- The audit and assessment program will be scheduled on the basis of the status and importance of the activity.
- Audits and follow-up actions will be carried out in accordance with documented procedures.
- The results of audits and assessments will be documented and brought to the attention of personnel having responsibility in the area audited.
- Responsible management personnel will take timely corrective action to noted deficiencies and/or adverse quality conditions.

Parsons senior and project management will also periodically review the company and project quality system at appropriate intervals to ensure its continuing suitability and effectiveness. The process for dissolving disputes, which may arise during audits and/or assessments, is defined in Sections 9.7 and 9.8.

2.3 QUALITY MANAGEMENT PLAN DEVELOPMENT

The Director of Quality and Training has overall responsibility for coordinating QA-related services within Parsons. He also coordinates with office and project Quality Assurance Managers to assure QA resources are adequate for specific projects. It is the responsibility of Division and Regional Managers to establish QA programs and appoint Quality Assurance Managers within their units, and to request needed QA support from the Director of Quality and Training when QA services are required.

Project QA managers, engineers, and specialists develop quality systems and procedures for integration into project quality assurance, management or execution plans. Once these systems and procedures are approved, QA engineers maintain the system by performing QA functions. These include verifying and attesting to the adequacy of design, engineering, procurement, and construction for conformance with requirements, including maintaining construction project QA/QC plans and procedures.

This QMP is prepared at the Project level and is reviewed and approved by the assigned QA Manager and the assigned PIC, who is the Cleveland Office Manager and Midwest Area Manager.

Development, Washington, DC, November 1995), unless otherwise specified. The SOP is reviewed and approved by appropriate Parsons senior management staff as the method to be used for a particular routine task.

SOPs are developed as needed by Parsons offices to cover specific operations and to standardize new activities. SOPs are referenced in or attached to the QAPP, if they are work assignment-specific. If SOPs require modification for a work assignment, the modifications are discussed in the QAPP. Existing SOPs are revised when new equipment is used, when comments by personnel indicate that the directions are not clear, or when a problem occurs.

New and revised SOPs are reviewed and approved by the QA Manager or subcontractor QAC, as appropriate, before implementation. The QA Manager or QAC, as appropriate, will ensure that obsolete documents are removed and that the revised SOPs are used in subsequent tasks.

7.4 DATA EVALUATION

Information sources that might be used to obtain data for work assignments include the USEPA or other federal, state, and local agency personnel and files, along with contractors, published and unpublished documents, and direct measurement or observation. Regardless of the source, sufficient documentation is required to ensure an independent evaluation of the data, including its validity and proper representation. When appropriate, the original published sources are consulted and data entry and submission forms are developed to check for minimum data requirements. Appropriate qualifiers are assigned to the data. Data gaps are identified and any data inconsistencies noted. Edit checks are conducted to evaluate completeness of the data, conformance of the data to the proper format, and whether data are acceptable based on requirements for allowable (permitted) values or are within the specified range.

7.5 CUSTOMER SATISFACTION ACCEPTANCE CRITERIA

The acceptance criteria for data collected for a Project is discussed in Section 7.1.2, Data Quality Objectives. All reports and other documents prepared for a Project will be submitted to the client for their review and acceptance prior to finalization and submittal to ant reviewing authority (if required). The acceptance criteria is meeting the contract requirements while providing a document satisfactory to the client.